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Journal of Electricity and Western Industry

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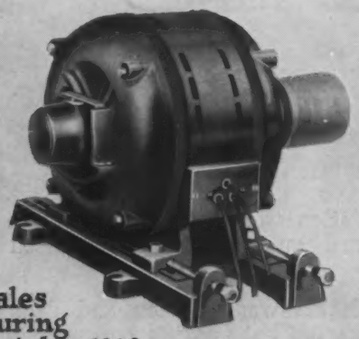
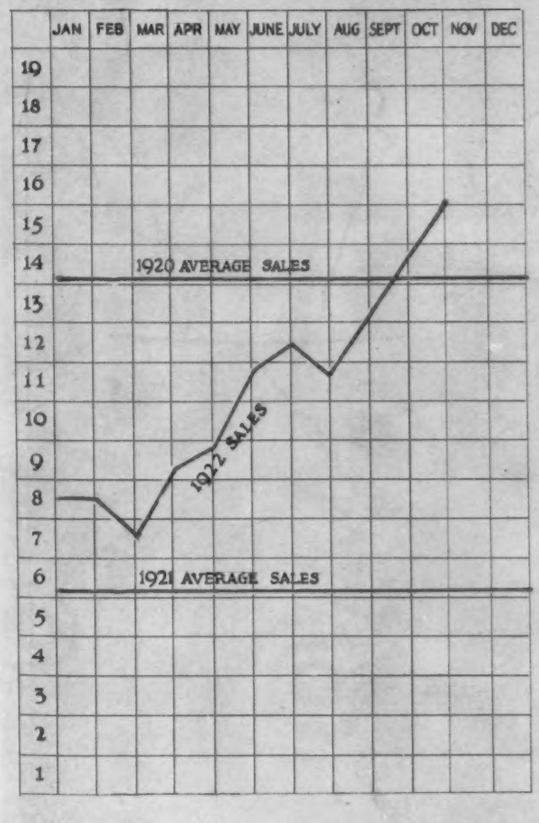
Sales During October 1921

Comparison of sales in October 1921 and 1922 is represented by the two Howell Red Band Motors.



Sales During October 1922



Sales Volume 3 Times Greater Than Year Ago

Howell Red Band Motor Business Increases 300 Per Cent over October 1921, in Spite of Price Reduction of Nearly 40 Per Cent

More Red Band Motors are being built today than any other time in the history of the Howell Electric Motors Company.

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Carried for Your Convenience
by

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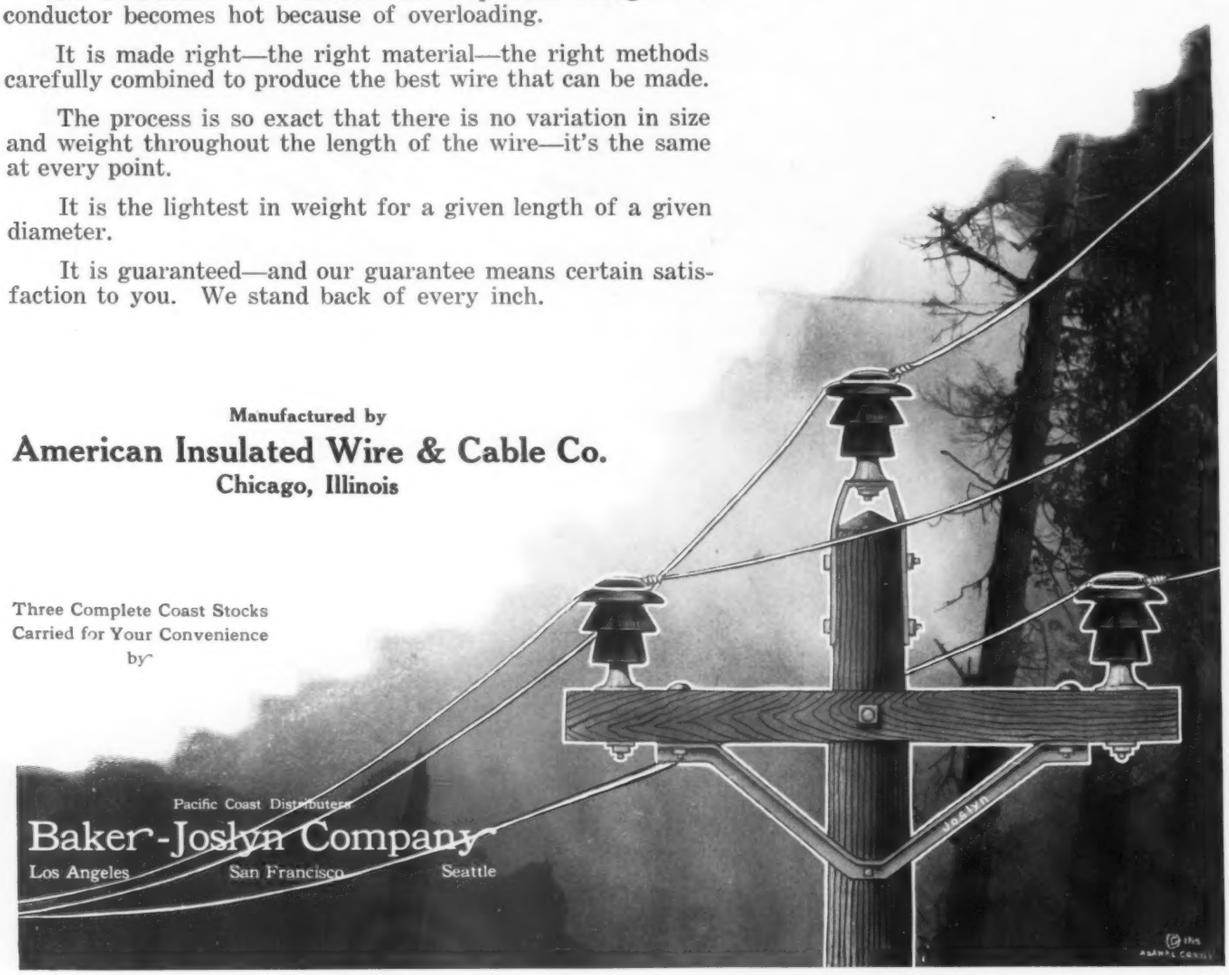

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Contents

EDITORIALS 389

Need for Simplified Rates—The Electrical Equipping of Public School Buildings—Engineering Qualifications Not the Only Ones for Utility Commissioners—Should the Public Be Expected to Do as We Say and Not as We Do?—Results of Colorado Conference Vital to Western Development—Profit Is a Factor Which Cannot Be Eliminated from Industry.

BUILDING A RURAL LOAD—by W. M. Shepard 397

How The California Oregon Power Company Has Developed the Intensive Use of Electricity in a Wide and Sparsely Settled Territory, Increasing Its Peak Load 150 Per Cent in Five Years.

SERVICE THAT BUILDS BUSINESS—by J. E. Bullard 402

The Merchant Who Has the Large Trade and Conducts the Successful Business Is the One Who Practices Satisfying His Old Customers in Order that He May Keep Them and that They May Bring Him New Purchasers.

BUILDING AN APPLIANCE LOAD—by A. W. Childs 404

A Description of the Way the Southern California Edison Company Increased Its Connected Load in 1906 Through the Merchandising Department of the Company and an Outline of the Plans for Further Developing the Load.

Current Comment	392	Meetings	419
Discussion	393	Personals	420
Electricity in Industry	406	Manufacturer, Dealer and Jobber Activities	422
Jobber, Dealer and Sales Agent	408	Trade Outlook	423
Industrial News	414	Construction News	424

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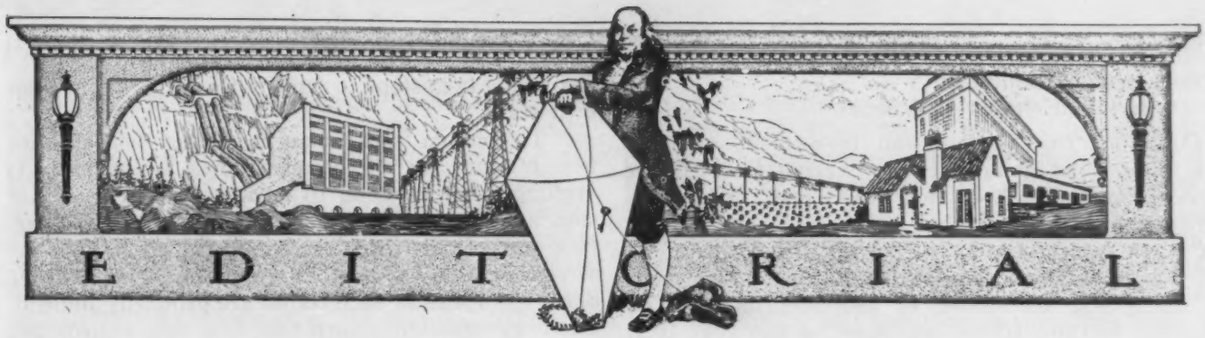


Need For Simplified Rates

THERE is one thing that the recent campaign against the Water and Power Act in California brought out most emphatically and that is a need for a simplified rate schedule. Time and again the public mind became confused by the various voluminous rate schedules that were quoted to them.

BROADLY speaking, there is need only for four fundamental rates: a rate for agriculture, a rate for industry, a rate for lighting, and a rate for cooking and household uses. It is to be admitted that refined engineering and technical research can be brought to bear to show that the rate situation is far more complicated than this, yet it is believed that the sacrifice of much of this refinement for simplification of the rate schedule will do much towards a better understanding on the part of the public of the great problem of electric power distribution.

IT IS easy for any person with only a modicum of business sense to follow the basic law, that total income from a public utility must be sufficient to pay the cost of service; and that this cost includes a reasonable return on the money invested. The general understanding of the basic principles of utility service will increase in direct ratio to the simplification of rates. The result will be a greater sympathetic understanding on the part of the public and the establishment of a confidence in those handling the affairs of a utility, impregnable to the onslaughts of the demagogue.

A COMMITTEE has been appointed by the California Electrical Cooperative Campaign to memorialize the California Railroad Commission on this very subject, and it is believed that similar movements in other commonwealths of the West may be undertaken with profit.

The Electrical Equipping of Public School Buildings

THE fact that there is an investment of huge proportions going into the various new public school buildings throughout the West, makes the proper electrical equipping of these school buildings of major importance at the present time. Instances of the proportions in which building of this nature is under way are shown in the program of Los Angeles for new school buildings for the year 1923 totaling the sum of $17,000,000, and of San Francisco for $12,000,000. In Seattle, Portland, Spokane, Denver and other cities of the West proportionate amounts have been allowed in the budgets for the coming year.

The way to sell the electrical idea to the schools is to begin at the top and work down. First, the Board of Education should be approached and the electrical idea sold to them, also its importance in the future of the West. In certain districts this importance is more emphatic than in others. In California, for instance, it is estimated that the present fuel supply will have been exhausted within the next twenty-five or thirty years. The use of electricity may as a consequence become imperative as the years roll on. Having won the favorable opinion of the Board of Education, the next move is to invite the domestic science teaching force to an electrically cooked dinner. In some cities this may involve the entertainment of three or four hundred teachers, but the end to be obtained is well worth the effort involved.

It is practically impossible to completely put over the electrical idea to a domestic science teaching force, much less carry on proper instruction in electrical methods, unless the building itself is properly wired and equipped for the use of modern electric appliances. The time to do all this is when the building is being constructed.

Engineering Qualifications Not the Only Ones for Utility Commissioners

THERE are a number of vacancies on the various utility regulatory bodies of the West which must shortly be filled. Within the next two months there will be three vacancies on the California State Railroad Commission, to be filled either by the incumbent governor or the man who will take his place. One vacancy was created by the death of one of the members, a second member has announced his intention of resigning, while the term of a third will shortly expire.

There is a movement on foot to have at least two of these vacancies filled by engineers on the ground that the work of the commission is of such a nature that the engineer is the ideal man for the position. In an article in the November issue of the Pacific Engineer attention is called to the situation which existed two years ago, when a survey of the membership of the public utility commissions of the various states of the Union showed that out of a total membership of 167 but 5 were engineers, and the recommendation is made that the engineers of California take steps to remedy the situation in their own state.

To contend that a man be placed upon a public utility board merely because he is an engineer is arguing from a wrong hypothesis. It is true that such a body deals with engineering matters to a certain extent and that engineering training would be of considerable value to its members. On the other hand, the duties of such bodies are primarily judicial. Their organization is such that they may employ the best engineering talent available to prepare data for their hearings. In addition to supervising the operations of the electric public utilities of the state, the California Commission regulates the operations of the telephone companies, the intra-state and inter-urban railroads, the motor transportation lines, water companies and all other public utilities.

The ideal commissioner must be honest and sincere, he must possess integrity, he must have a knowledge of the law, a knowledge of business, and above all he must be an able and competent judge. There are a number of men in the engineering profession in the West who possess all of the above qualifications and who would be ably fitted to sit as members upon any of the utility regulatory bodies. Nevertheless, to recommend that such men be appointed merely because they are engineers is exceeding the bounds of sound reasoning. Before recommending any man for the position of California State Railroad Commissioner it will be well to take all of these facts into consideration.

Should the Public Be Expected to Do as We Say and Not as We Do?

ONE would be justified in being skeptical about buying hair tonic from a bald-headed barber, also about patronizing the restaurant whose proprietor ate across the street. Yet the percentage of domestic electric appliances in use among members of the electrical industry, as shown by questionnaires from several representative bodies of men, is surprisingly low. How can a man sell an appliance with conviction and sincerity unless he knows from experience that he is right? Can the public be criticized for hesitating in the electrification of its homes when only two central station executives in the entire West live in electric homes?

The era of domestic electrification would be tremendously hastened if those engaged in merchandising, or manufacturing electric appliances or in producing energy, could look a doubting customer squarely in the eye and truthfully say, "I know it is true, I use one myself."

The time has come when men of the electrical industry themselves must set the example of faith in electrical household appliances. It is true that there are many reasons why more electrical men do not themselves use these household appliances in their own homes, but the fact remains that if we are to enter upon the tremendous new field of opportunity before us we of the industry ourselves must make personal sacrifice, if necessary, to see that things are done the electrical way in the home. This means, of

course, that friend wife must be taken into our confidence.

There is a movement on between two of the great weekly electrical luncheon clubs in the West to encourage the use of electrical household appliances by electrical men. To this end a contest is to be staged between the two entitled "The Supremacy of the Kilowatt." The procedure will be something as follows: At meetings of the two clubs the electric range, the electric water heater, the vacuum cleaner and other household appliances will be shown in detail and their uses and economies explained. Then the wives of members will be invited to subsequent meetings and the same program will be gone into with much more detail.

A feature of the contest will be a graphic representation showing the new kilowatts that have been put on the line by the purchase of household electric appliances in the various homes of the members. At the end of an agreed upon period the club having the highest new kilowatt connected load will be said to have won the kilowatt supremacy and an electric range will be given by one of the manufacturers as a prize.

Here is the beginning of a new idea. The encouragement of the use of household electrical appliances in the home by members themselves is the only way that the ultimate ideal of the home electric is to be put over. Members of the industry throughout the West are urged to back similar moves as that outlined above, wherein the supremacy of the kilowatt in the home is given every emphasis.

Results of Colorado Conference Vital to Western Development

ALMOST two years have passed since the development of the Colorado River has been occupying a prominent position in the press and has loomed large in the public eye. At the time this is written a conference is being held in Santa Fe at which it is hoped final adjudication of many conflicting claims will be made. It is imperative that the utilization of this great stream be started at the earliest possible moment.

A year has slipped by since a substantial offer was made at the Riverside convention of representatives from all sections of the Southwest, to the extent of $30,000,000 per year in actual construction, should private initiative be allowed to get under way in this development. How much further delay will take place no one knows, but we do know that no one at the present time is urging anything but safe and sane development of the Colorado under the most scrutinizing supervision of the federal and state government, and that every safeguard be employed to see that this great work proceed in such a way that the most economic development take place.

This annual outlay of $30,000,000, the investment of which has thus far been delayed, would develop approximately 100,000 horsepower, and 100,000 horsepower means the employment of 1,300 people in new electrical industries in the West with a salary payroll of $2,000,000 annually. It means the furnishing of electricity to an additional 25,000 new homes serving 100,000 new people. It means the operation of mines and reduction plants producing $18,000,000 of mineral annually and employing 4,000 miners. It means the operation of 1,300 factories representing $100,000,000 in investment, employing 27,000 persons, and producing $140,000,000 worth of goods annually. It means the irrigation of 125,000 acres of land, resulting in the expenditure of $6,250,000 for improvements, producing annually $9,500,000 worth of crops and employing 5,000 farmers and laborers.

So reads the record of the past in the development of each unit of 100,000 horsepower, and with the growth in population that is now under way in the Southwest, it means at least this for the future. The answer, then, is clear. Every provision should be made for complete development and, having applied every reasonable safeguard for public interest, nothing should be allowed to further delay the unlocking of these great gigantic resources for the upbuilding of the West.

Profit Is a Factor Which Cannot Be Eliminated from Industry

CHARLES R. GOW, president of the Associated Industries of Massachusetts, in a weekly journal addressed to members of his association, has expressed some ideas which are deserving of wider circulation. His message entitled "The Philosophy of Profit" follows:

"Leaders of radical thought usually assert that all production is the fruit solely of the wage worker's toil and that, therefore, profit in industry is morally indefensible.

"The fallacy in this reasoning lies in the obvious fact that workers in modern industry can produce nothing until some one has first supplied them with the necessary tools and facilities required for their several operations. Even then production can only result under the proper direction of experienced management capable of intelligently co-ordinating the varied abilities of the individual employees.

"In the days when man lived a primitive existence, he retained for his own benefit the entire productive result of his labor, but it should be noted that under such conditions he was frequently subjected to extreme privation and suffering owing to the meager return which oftentimes attended his efforts.

"From the time when men first conceived the principle of the division of labor, which has made possible the advancement of civilization to its present status, the individual worker has been obliged to contribute a portion of the value of his production to those who have assisted him to prosper beyond the limits of his own unaided ability.

"It is a most significant fact that every experimental effort which has ever been undertaken to eliminate all profit from industry and to appropriate to the individual worker the entire value of the output of his labor, has resulted in an involuntary return to a social condition approximating the primitive state of mankind."

CURRENT COMMENT

U. S. Railroads Most Efficient in the World

The management of the principal railways of the United States today, by all the tests of administration, of load factors and of mechanical efficiency, is the most efficient transportation in the world in so far as it is not limited by causes beyond the managers' control, according to the annual report of the Secretary of Commerce for the fiscal year 1921-1922 which has just been made public. While the transportation facilities have seemingly lagged behind the necessities of the country, the demoralization of the war, strikes, lack of finances and other causes beyond the control of the executives have been largely responsible.

The report of the Secretary of Commerce, while discussing the railways, justifies the principle of the operation of utilities by private initiative under public regulation when it says:

"The situation has been contributed to by the war, but also fundamentally by the cumulation of experiments in public relations to the railways, both national and state. We have tried uncontrolled operation; we have tried negative regulation in the prevention of discrimination; we have tried nationalization; we are now trying positive regulation. Nationalization would be a social and economic disaster; free operation would reconstruct the vicious practices of 30 years ago. Regulation in some form is necessary, but constructive development of this regulation—to preserve the initiative and responsibility of our railway executives, to secure the fine values of private operation, and at the same time to secure public protection and assure adequate service, is absolutely vital and not necessarily incompatible."

Wireless May Be Used in Mine Rescues

Tests conducted at the experimental coal mine of the Bureau of Mines at Bruceton, Pa., hold out the hope that wireless waves may be used in the future as a means of effective communication between rescuers on the surface and miners entombed in mines following fires and explosions such as the recent Argonaut disaster in California. These preliminary experiments of the Bureau of Mines, made in cooperation with the Westinghouse Electric & Manufacturing Company, while failing to develop any practical method of using wireless waves for underground communication, nevertheless indicate clearly that electromagnetic waves may be made to travel through solid strata. In the Bruceton experiments, signals were heard distinctly through fifty feet of coal strata, although the audibility fell off rapidly as this distance was increased. The absorption or loss of intensity with distance is very great for the short wave lengths used in these tests.

Longer wave lengths are known to suffer less absorption and may possibly be found practically effective under certain conditions.

The mine telephone has been perfected to such an extent that it is giving satisfaction in most mines where the wiring is well insulated. Very often the telephone cannot be depended upon on account of falls of rock, grounding due to worn insulation or extreme dampness. In the event of a disaster it frequently happens that the mine telephone system is put out of commission by the agency that causes the disaster, at the time when it is most urgently needed. On this account the mining industry is interested in any kind of telephone system that can be counted upon in an emergency. Many requests have been received by the Bureau of Mines to devise means of utilizing wireless methods for this purpose.

Electric Rates in Japan Are Reduced

What "Denkinotomo," the electrical trade paper of Japan, characterizes as drastic rate reductions, have been put into effect in the principal cities of that country through a recent order of the Department of Communications. The reduction in rates has been brought about by a decrease in practically all commodities. The new rates form an interesting basis for comparison with power and lighting rates in the United States. In the new schedule power rates run from 2.5 to 4 cents per kw-hr., while lighting rates are computed on the basis of 27.5 to 44.5 cents per 16 cp. lamp per month. The following table gives the old and the new rates for some of the more important cities in the country:

City	Old rate lighting	New rate	Old rate power	New rate
Osaka	62	55	8.5	7.0
Kyoto	96	89	8.5	7.5
Kobe	94	80	8.0	6.5
Yokohama	72	65	10.0	8.0
Hiroshima	75–105	75	4.5–7.5	5.0

The figures are given in sen, equivalent to one-half cent.

The rate reductions to do not apply to Tokyo, where no increases were made during the war.

Coal Operations in the West Are Increasing

The future extensive development of a substantial coal-mining industry in the public land areas of western states is forecast in statistics compiled by the Federal Bureau of Mines which show that up to Oct. 1, the bureau had issued 263 permits for prospecting for coal on government lands, 42 leases for commercial coal operations on these lands, and 5 licenses for production of coal limited to personal use. These authorizations are grouped by states as follows:

	Permits	Leases	Licenses
California	2	..	..
Colorado	51	6	2
Idaho	4	..	..
Montana	36	2	1
Nevada	14	..	..
New Mexico	13	2	..
North Dakota	4	5	..
Oregon	19	..	..
South Dakota	3	1	1
Utah	27	15	..
Washington	14	2	..
Wyoming	76	9	1

The total minimum annual production of coal required in the issuance of these various authorizations is 1,586,550 tons, which is approximately equivalent to the total annual coal production of Michigan and which approaches the yearly coal production of Arkansas or Texas. The total investment to be expended on leases amounts to $2,453,550.

A total of 228,224 acres of the public domain is covered by permits for coal prospecting issued by the Bureau of Mines; for coal leases, 26,910 acres are covered, and for coal licenses 220 acres.

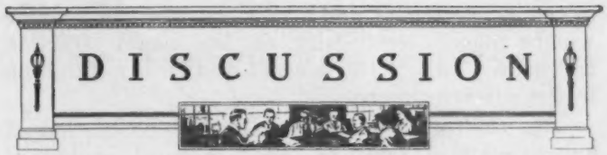
Up to Oct. 1, four potash development leases had been granted, covering 7,343 acres; 11 potash permits, involving 28,000 acres, had been granted. One oil shale lease, covering 1,920 acres, and 1 rock phosphate lease covering 360 acres, have been issued by the Bureau of Mines.

Power Company Wireless System Planned in Japan

Application for government sanction to establish a wireless telephone system has been made by the Daido Electric Power Company, of Nagoya, Japan, according to advices received by the Department of Commerce. The company proposes to operate this wireless system primarily for its own convenience in connecting the various stations with its electric light and power system, but its use may be extended eventually to the general public if sufficient demand should arise.

As at present planned the wireless system will start from Okuwa in Nagano Prefecture on the Central Japan Railway Line, from which point communication will be established through Nagoya and as far as Osaka, a distance of about 150 miles.

This power company has an extended distributing area, its principal sources of energy being hydroelectric plants located in the mountainous regions. Due to the general absence of telephone and telegraph lines, the radio telephone will probably facilitate communication to a great extent.



Interview with W. S. Murray on Railway Electrification in the West

By Robert Sibley

William S. Murray, prominent consulting engineer of New York, who is well known for his work in connection with the electrification of the New York, New Haven and Hartford Railway, the Superpower Survey, and the Murray and Flood Report on the Hydro Electric Commission operations in Ontario, Canada, has recently completed a tour of the Pacific Coast, during which he visited many of the hydroelectric developments in this area.

The thought that the views of a man of such unquestionable authority would prove interesting to western men, prompted the following interview on railway electrification. Electrification of the steam railroads will become increasingly important as the future unfolds. Mr. Murray is of the opinion that the electrification of the railroads of the West is practicable and feasible at the present time, due to the present interconnected transmission systems and initiative of the power companies, which have removed many of the obstacles.

The interview follows:

I understand, Mr. Murray, that the investigation known as the Super-power Survey, of which you served as chairman, was undertaken to study the economies that may be brought about by interconnecting certain of the present power systems in a zone extending from Boston to Washington and westward from the Atlantic coast 150 miles. In your observations in California and the West, what comparisons would you make as to what you saw here already existent in a super-power system as compared with your proposed system in the East?

During the last five weeks I have been in California and had opportunity to study the territory, its peoples and the power and distribution problem, both in the north and south parts of the state. Your question suggests a very interesting comparison. In the eastern zone you have described there dwells 25 per cent of the population of the country, approximately twenty-five million people. The area of that zone is 60,000 square miles, its heavy railroad mileage, 36,000; there are 76,000 industries and of public utility companies, 350 in number, which include 550 power stations. The electrical demand for power in that zone as of 1919 was approximately 4,000,000 kw. and energy demand, 16,000,000,000 kw-hr. By projecting electric utility load curves, it is indicated that as of 1930 the electrical demand will be 10,000,000 kw. and the energy demand 31,000,000,000 kw-hr. In 1930 all new industry will be electrically operated and much

of the old electrified, and a very considerable tonnage will be moved electrically on the heavy traction railroads. This is the present and future situation in the eastern super-power zone.

In California I find you have a population of approximately 4,000,000 and a natural source of water power unexampled in the East. It might be of interest to know that taking advantage of the entire head between Lake Erie and Lake Ontario, if every second-foot at Niagara Falls was turned into power, leaving the crests of the natural dams at Niagara dry, California has within transmission distance of her future industrial development power in excess of this amount. I would supplement this, also, with the statement that during the five weeks I have spent in California I have had opportunity to examine some of the principal present and future hydroelectric features both in the north and south sections of the state. In the north I refer to the Pit River developments, in the south to the Big Creek development. It is apparent that in the construction undertaken in these two districts, the highest order of efficiency in the production of power has been in the minds of the engineering and managerial departments of your public utilities. Here I have seen illustrated a slogan which every engineer should follow, namely, that good engineering is the art of making a dollar earn the greatest interest.

Passing into the field of transmission and distribution, I have toured a very large section of the country with the objective of ascertaining the method pursued in the transmission and distribution of power to customers in all classes—manufacturing, mining, agricultural, commercial and domestic. I have found a foundation of power laid with a superstructure of transmission and distribution upon it designed so that the immediate demands of the peoples in the above classes can be met, but so fashioned as to permit instant and efficient expansion to their ever rapid and increasing requirements. Therefore, in answer to your question, having described the conditions in the East and the West, it can be said that you have already possessed yourselves in the West of a super-power system the general characteristics of which we will require in the East.

In view of the fact, Mr. Murray, that we have existing here in the West this super-power system that you have just described, do you see the possibilities of steam railway electrification in California?

I certainly do.

What are some of the general economies that prevail in railway electrification?

Density of traffic is the controlling economic feature of railway electrification and density of traffic may be split up into three economic features—the saving of fuel, lower maintenance costs of electric motive power, and consolidation of trains which permits of a saving in train miles.

I understand, Mr. Murray, that you had a substantial part in the electrification of the New York, New Haven & Hartford Railway. Would you mind telling me some of the economies brought out in that electrification?

The principal economies effected in the electrification of the New Haven lines were in the three departments I have just mentioned. The fuel consumed for the train schedule performed in the three classes of service, freight, passenger and switching, was 50 per cent, locomotive repairs, about 50 per cent, and at the time I was in charge of the New Haven electrification, the return on the net economic investment for the electrification was on the order of 14 per cent.

Why is it then that all steam railways of America do not electrify at once?

There are a number of reasons, three principal ones of which are—first, that there has been so much discussion between the electric companies regarding the system that should be used. When the management of a railroad is in the frame of mind to consider electrification, that frame of mind has been discouraged by the two large manufacturing interests upon request for bids to insist on the application of the system that they advocate and make claims against the system being advocated by the other. The management concludes, therefore, that if the large electrical companies cannot agree as to system, it would be dangerous to electrify.

The second difficulty is that in the immediate past the railroads have been so seriously embarrassed financially that even had there been unanimity of opinion as regards system, but a few could have electrified.

The third reason might be laid to the fact that the railroads have been approached from the wrong angle. In my opinion the management of railroads has not been properly educated by the interests who desire to sell electrification to them. The approach has been made through the doors of the financial department or in the executive chambers of the railroad corporation. It would be a far healthier aspect if the management could be convinced that electrification is the proper procedure and have them carry it to such executives. Thus there would be an acceptance of responsibility on the part of the management. Per contra, if electrification is sold to the executive and financial officers of the road, the management is not responsible for results. For illustration: The electrical engineering department of a railroad might show the cost of the electrification of a grade to be $9,000,000 and a return on that money so spent to the extent of 10 or 15 per cent, possibly 20 per cent, and further than that, show by electric operation over the same rails a created capacity of 50 per cent in excess of that secured in steam railway operation. Then the first question the management asks of the electrical engineer, notwithstanding these economies and increase of capacity, is "How much will it cost to lay down another track?" and when the electrical engineer, after consulting the chief engineer of the railroad, finds that this will also cost $9,000,000, profits and increase of capacity through electrification are forgotten by the management in the thought that there is an extra set of rails to take care of trouble that might exist

on the other. Just so long as this wrong state of mind exists, electrification will be delayed, and yet I say it is the duty of the electrical engineer to educate the management first.

Mr. Murray, referring again to this super-power situation in California, isn't it true that some of this enormous additional investment necessary for railway electrification can be done away with, due to the fact that power lines are already existent to supply this power?

That is a very important question, Mr. Sibley. I am glad to answer it this way. In the early days of electrification the railroad company had to make investment to the extent of 100 per cent. It had to finance its power stations, its equipment, its transmission and contact lines. Today that 100 per cent is reduced to possibly 20 per cent. Today the public electric utilities with their tremendous investment in power stations and distributed location are ready to furnish power necessary to electric movement of trains, and as the future will unquestionably see a drawing together of standards in electric motive power for the propulsion of freight, passenger, suburban and switch movements, there will be an equipment designed operative upon the various railway properties. This will permit financing the motive power on an equipment trust basis. Relieving therefore the railroads of the financing of their power stations and their motive power, there will remain only the contact lines to be financed which represents about 20 to 25 per cent of the whole.

My understanding is that practically all of the electrification connected with the New York, New Haven & Hartford lines was on comparatively level ground. In California the situation is quite different. For instance, we have the climb known as the Tehachapi Pass between San Francisco and Los Angeles, the crossing of the Sierras out from Roseville over to Sparks, Nev., and the climb of the Siskiyous from Gerber, Calif., on over into Ashland, Ore. Such climbs as these necessitate gigantic power in comparison with the comparatively low power requirements of the great valleys below. Do you think that this situation will hasten the day of railway electrification or will retard it, and why?

I most certainly think it will be hastened—first, because this super-power structure you have already erected will be the means of supplying power where it is required for the railroads. Highest economy is shown in the matter of electrification when applied to grades. This must be apparent to any casual observer in noticing sometimes five steam locomotives hooked together carrying a train over a summit where an electric locomotive, with possibly one pusher, can perform the work at better schedule, and while regenerative braking on these grades is advantageous from a point of conservation of power, its highest value is secured in the safety of operation and the enormous saving on the wear and tear on brake gear.

Is the scrapping of the present locomotive equipment a deterrent factor in railroad electrification generally?

There is no such thing, because immediately a division is electrified the steam locomotives that originally operated on that division are transferred to others. A railroad is constantly purchasing new locomotives to cover their depreciation schedule and the locomotives so transferred merely take the place of new ones which otherwise would have been purchased. You, of course, understand that if we started out to electrify all the railroads it would take many years to accomplish it. The number of steam locomotives replaced by the electric locomotives would be constantly used for replacement on other lines.

I have heard it said, Mr. Murray, that there is not sufficient power in California to completely electrify the Southern Pacific and Santa Fe lines within the borders of California. What is your opinion about that?

In answer to that question, Mr. Sibley, I happen to know what the schedule is for increasing the capacity of the electrical generating plans in California and I can say to you, with the full consciousness that it is a fact, that I do not believe it would be modified to any great extent by the amount of power required to operate all of the heavy traction roads in your state.

I have also heard it said, Mr. Murray, that the sudden stopping and starting of the great transcontinental freighters would interject upon a power system such sudden demands for power that the voltage regulation and other operating features might become seriously demoralized. What is your opinion about that?

My answer to that, Mr. Sibley, is that if I were dictating the policy of the sale of electricity to the steam railroads to be electrified in California I would offer them that power with no charge for demand. I would sell it purely upon the kilowatt-hour basis.

In round numbers, Mr. Murray, have you any idea as to the amount of money that would be required to do this big job of electrification in California?

I do not know what the heavy traction mileage is in California that could be economically electrified, but I think it is safe to say that the contact systems which the railroads would require would cost on the average of about $10,000 a mile as measured upon a single track basis. Similarly, not having examined the railroad schedule performed, it would be impossible to state the motive power investment required. The motive power, however, I believe could be entirely financed by equipment trust bonds, thus relieving the railroads of that burden of expense.

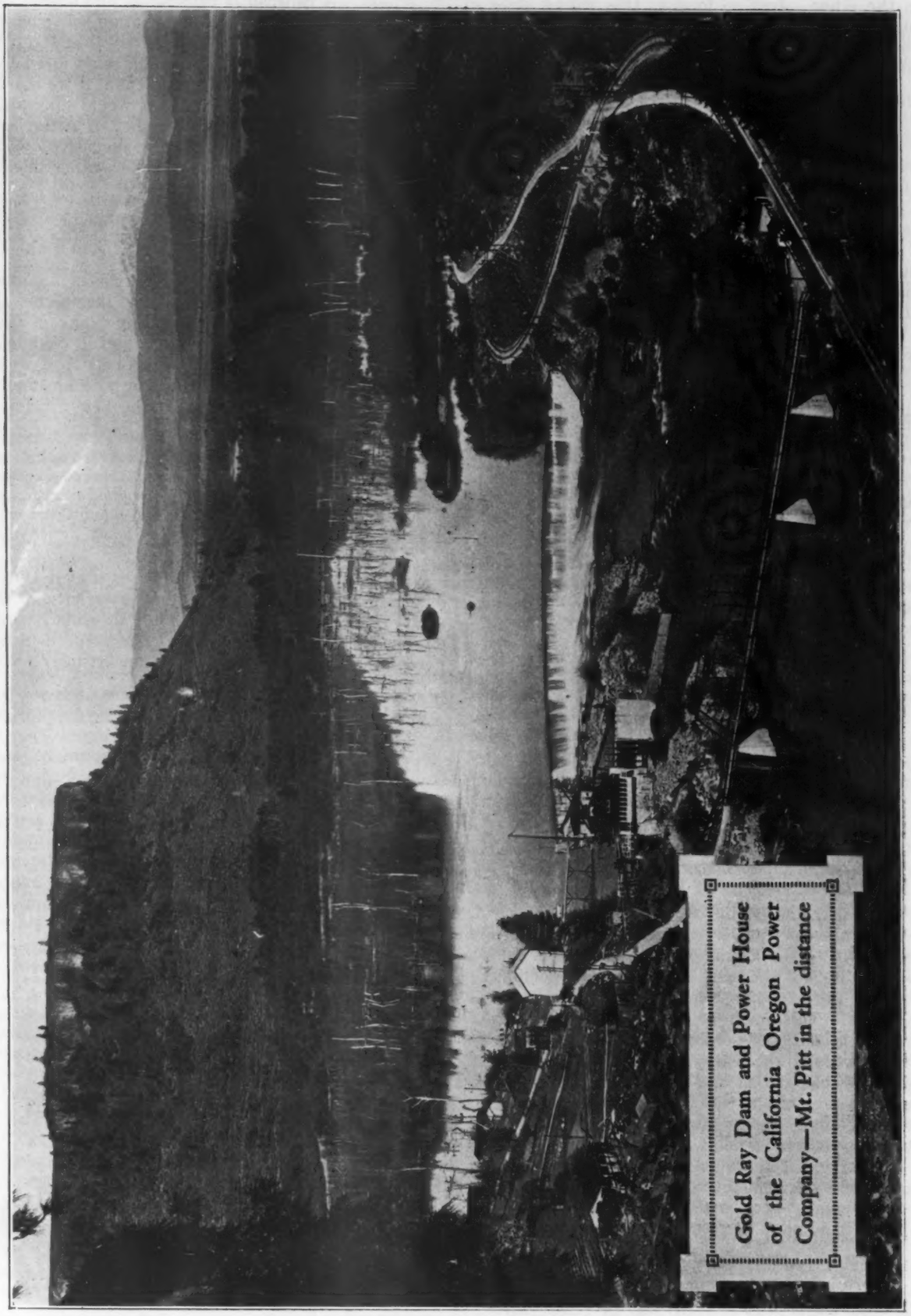
Then I understand, Mr. Murray, that your thought is that in this electrification era, which will probably be upon us in the immediate years ahead, that the railroads themselves will largely be relieved of the financing necessary for the power supply and for the rolling stock equipment, leaving for them alone the contact work.

That is what I hope for very much and is the objective toward which I have been working for many years.

I suppose that there could be no separate financing brought about for the handling of the contact work, that the railroads themselves will have to do that.

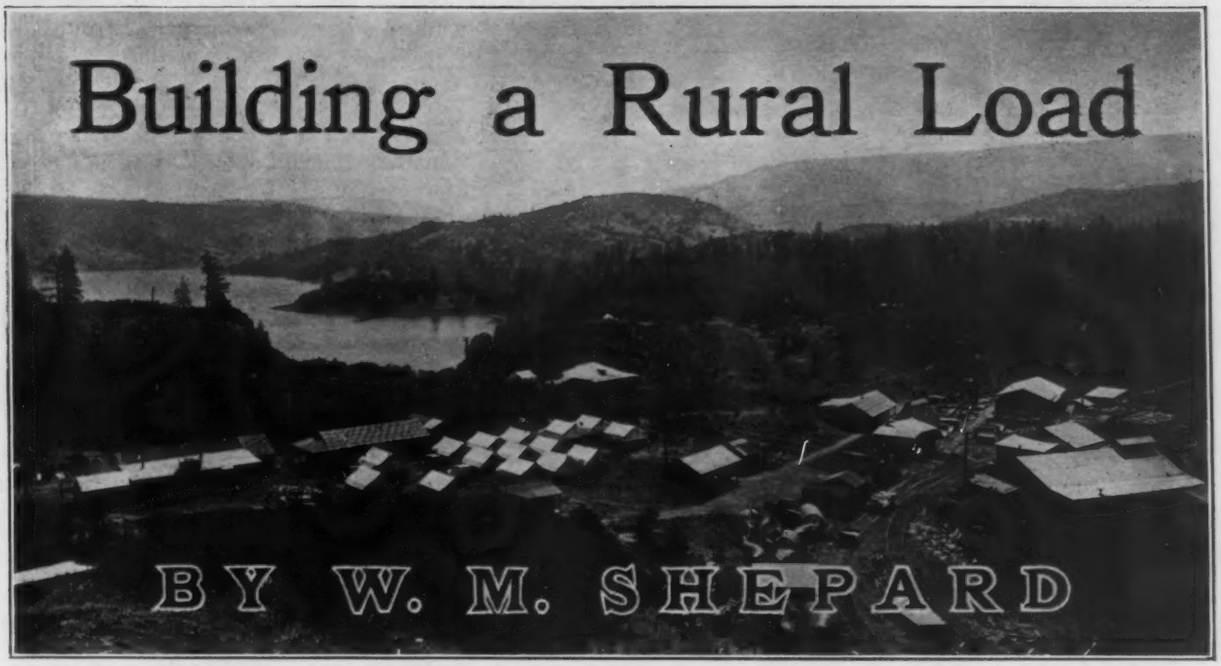
I would think that the better plan, since the cost is so minor, that the railroads themselves should finance this item.

Thank you, Mr. Murray.



Gold Ray Dam and Power House of the California Oregon Power Company—Mt. Pitt in the distance

Building a Rural Load



BY W. M. SHEPARD

HOW The California Oregon Power Company has developed the intensive use of electricity in a wide and sparsely settled territory, increasing its peak load 150 per cent in five years. Mr. Shepard is general agent for the company at Medford.

THE California Oregon Power Company serves a territory in northern California and southern Oregon, extending from Delta in Shasta County, Calif., where its lines connect with those of the Pacific Gas & Electric Company, and from Trinity Center in Trinity County, Calif., northward something like three hundred miles to Springfield, Ore., where its system will connect with that of The Mountain States Power Company, serving the Willamette Valley as far north as the town of Dallas, Ore.

The company distributes electric power over a wide and sparsely settled territory, mountainous in character, but with several fertile and extensive valleys, which constitute the centers of population.

There are the Shasta and Scott Valleys in California and the Rogue River Valley and Klamath Basin in Oregon. The principal agricultural products of these valleys are fruit, the Rogue River Valley being famous for its pears and apples, dairy products, alfalfa, and diversified farm products.

In the northern California section, or Siskiyou division, and in the Klamath Falls region, cattle and sheep raising is one of the principal activities and large numbers of cattle and sheep are raised and fattened here and shipped to outside markets each year.

The intervening mountainous country is heavily timbered; the timber resources constituting one of the region's principal sources of present and future wealth.

The commercial timber of this region consists mainly of western yellow pine, sugar pine and Douglas fir. There are also large areas of white fir. It is claimed that the pine forests tributary to Klamath Falls constitute the largest body of yellow pine still standing in the United States.

It is truly beautiful timber and in some sections has almost the appearance of a park with practically no underbrush and with the tall, straight, clean looking pines spaced at almost regular intervals, their reddish-yellow bark standing out in pleasing contrast to the green foliage.

Power Supply Is Ample

With respect to power supply, the company is admirably situated, having modern hydroelectric plants, together with undeveloped power sites on both the Klamath and Rogue rivers. Both of these streams are characterized by remarkable uniformity of flow throughout the year and lend themselves to economical power development.

The Klamath River is one of the few streams on the Pacific Coast that breaks across the mountain barrier from east to west. It has its source in the plateau region east of the Cascade Mountains in Oregon and from streams draining the eastern slope of these mountains.

The region from which it derives its principal water supply is of geologically recent formation and abounds in lava fields. The streams in this region are largely fed from springs, the summer flow being well maintained on account of the porous nature of the country. The Klamath River drops some forty-two hundred feet from the outlet of the Upper Klam-

ath Lake to the Pacific Ocean, having thus a large amount of potential power.

The Rogue River has characteristics very similar to the Klamath River. It has its source on the western slope of the Cascade Mountains and north of the Siskiyou range.

The excellent water characteristics of these two streams, together with the accessibility of the company's power sites, and the fact that at these sites the power developments can be made without conveying the water through great distances, makes for economical power development.

The company operates without any steam plants whatsoever and is enabled to do this on account of the exceptional water characteristics of its power streams, together with the strategic location of its hydroelectric plants, seven in number, which are so located on the system as to give duplicate sources of power supply to almost every section.

The company has never faced a power shortage; its problem has always been to find markets and to this end, in addition to finding outlets beyond the limits of its own territory through interconnections with other power companies, it has directed its efforts toward developing the intensive use of electric power within its own sphere of distribution.

Business Growth — 1916 to 1921

From 1910 to 1920 the population of the territory served by the company's system increased from 60,569 to 77,663, or 28 per cent. It is estimated that between 1916 and 1921, the period now being considered with reference to growth of load, the population increased between fifteen and twenty per cent. During this same period the number of electric consumers increased from 7,478 to 9,775, or 31 per cent. The peak load on the system increased from 8,300 kw. to 21,000 kw., or 150 per cent, and the kw-hr. generated from 42,000,000 to 130,000,000, or 210 per cent.

The connected load in the same period has grown from approximately 15,000 kw. in 1916 to 38,000 kw. in 1921, an increase of 153 per cent.

An idea of where this load has been developed is obtained by a comparison with some of the main classifications as follows:

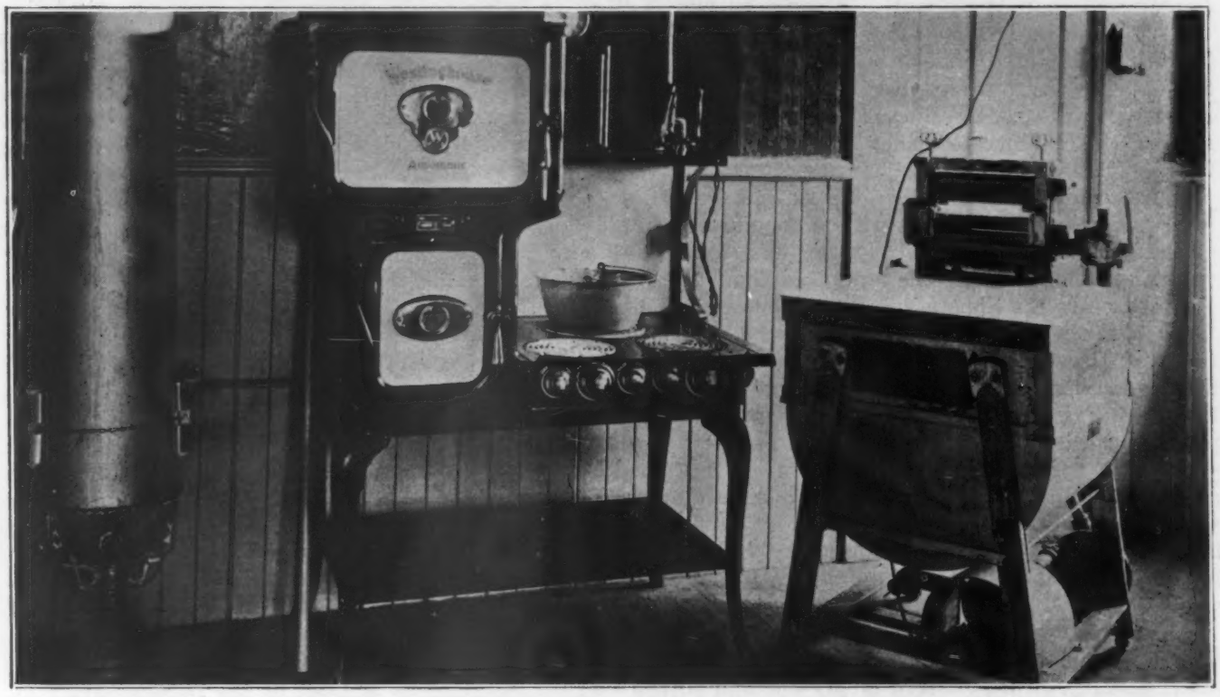
Class of Load	Connected Load in Kw. 1916	1921	Increase
Residential, including light and cooking	3,760	9,936	164%
Commercial lighting	1,471	1,802	22.5%
Industrial power	6,210	11,521	85.5%
Agricultural power	752	4,779	535%
Other, including Pacific Gas & Electric	2,800	10,000	260%

Residential Business Growth

It will be noted that the residential business has increased in far greater ratio than the population or number of consumers. This is due to the development of the electric cooking and water heating load and the use of electric appliances in the home.

In the development of this class of business the company has worked in close cooperation with the contractor-dealers in its territory and it is fortunate in having a number of enterprising and substantial contractor-dealers with whom to cooperate.

The company has made it a practice to route this business through the contractor-dealer, both the sale of range and water heater and the wiring for same. Also, the servicing of this equipment is now taken care of by the dealers without expense to the power company and this has been done for several years now with entirely satisfactory results.



A typical rural installation in the home of Wm. Bohnert near Central Point, Oregon, consisting of electric water heater, range and washing machine

Home and outbuildings on ranch of Wm. Bohnert, typical of the class of rural consumers served with "Copco" power

In getting this business under way, the company entered the field directly, selling the equipment and at first installing same, but as the business gathered headway, and as the contractor-dealers developed to the point of actively going after the development of this business, the company gradually stepped out of the way in their favor. It did this first by maintaining prices so that the dealers could make a fair profit, and then by withdrawing entirely from the field in favor of the dealers as they demonstrated their ability and willingness to actively handle the business.

The company contents itself now with putting on periodic range campaigns in which it works through the dealers, purchasing ranges in carload lots and turning them over to the dealers practically at cost, the dealers selling at a fixed retail price, both the company and dealers advertising and cooperating with the manufacturers in putting on demonstrations.

The cooking and water heating business has developed to a greater extent in the Rogue River Valley than in the other territory covered by the company's operations. In the Rogue River division there are approximately 1,000 domestic electric ranges in use out of a total of 4,400 residential customers, or a saturation of over 22 per cent.

The saturation in the Klamath division is 10 per cent and in the Siskiyou, or California division, 5 per cent. In the Rogue River division conditions are more favorable to the development of electric cooking than in the other two divisions, the climate is milder and there is a larger urban population.

Commercial Heating and Cooking

The company has also developed a considerable business in commercial heating and cooking. Of course, there is not the diversified use of heat in manufacturing or industrial processes that exists in the larger cities and the company has had to confine its efforts largely to hotels, restaurants, clubs, and bakeries, and to water heating for various purposes, such as barber shops. A very substantial load has been developed from these various uses. The advantages of electricity as a source of heat sometimes come out in a way not altogether expected—for instance, the Shasta Springs Hotel Company has equipped its cottages with 1,500-watt radiant air heaters, not only for the comfort and convenience of its guests during the ordinary season, but also in order to enable it to open earlier and close later, or to get a longer season. Due to the cleanliness, convenience, and comfort of electric heat, it can be used in resorts of this kind where other forms of heat would be out of place.

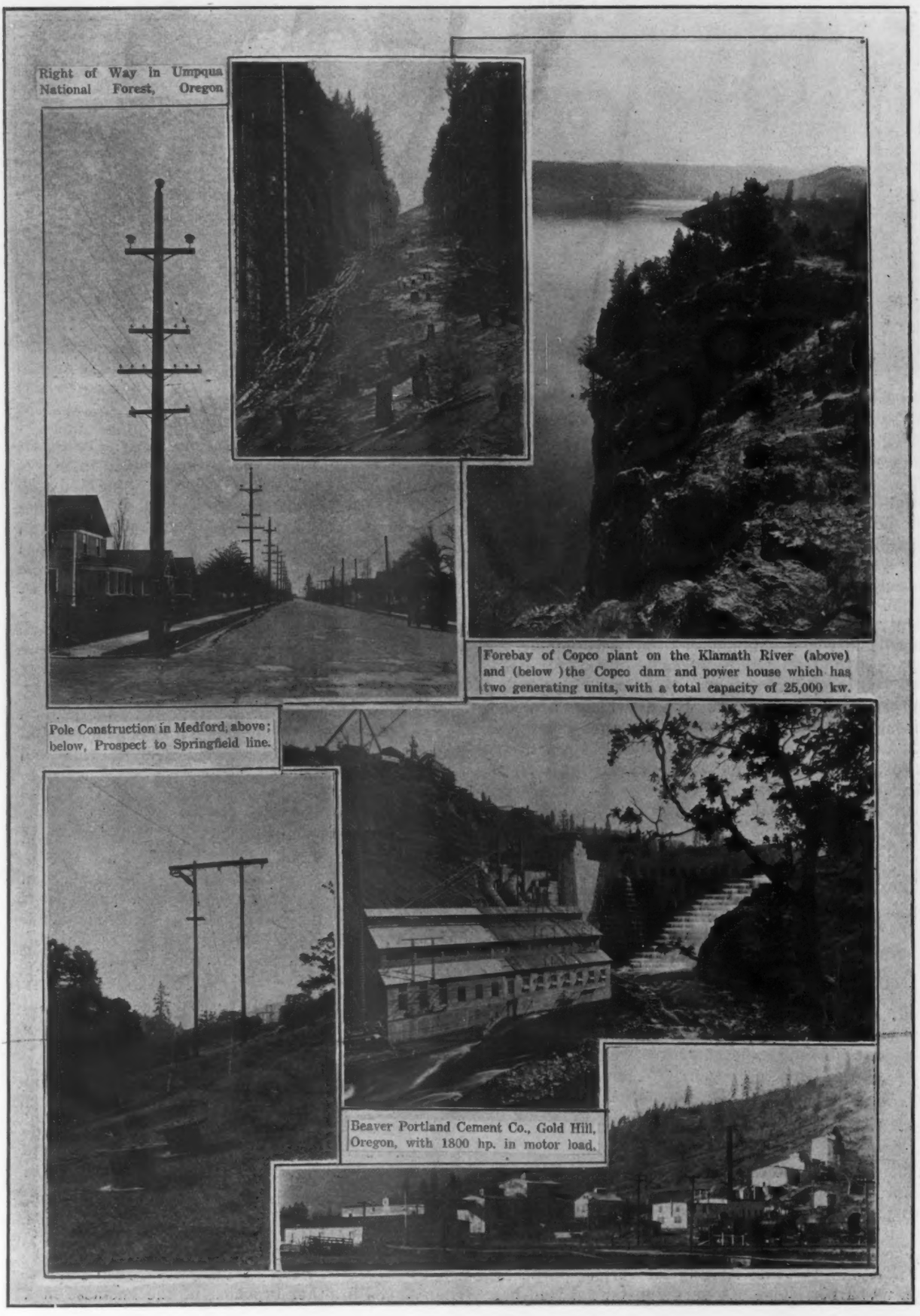
The company has been quite successful in introducing electricity into restaurants and bakeries and has on file unsolicited letters from consumers expressing their satisfaction with electric ovens and the service received.

Industrial Power Load

The industrial power load has been developed by unrelenting pursuit of all available business, including sawmills and box factories. This latter load is difficult to secure, inasmuch as large amounts of refuse fuel are produced as a by-product, and, ordinarily, unless this is burned to produce steam power, its disposition becomes a source of expense.

It has been our experience that mill operators are at first doubtful of the desirability of central station power for their uses. They are as a rule used to having a self-contained plant and look upon the use of mill refuse for the generation of power as the natural and obvious thing to do. It is also difficult to bring home to them a realization of the true cost of generating power from mill refuse.

However, consistent effort on the part of the power companies, together with their own experience or that of other mill operators using central station power, will eventually convince most operators of the merits of central station service. This is particularly true of the small or moderate size operation, especially where capital is not plentiful and can be employed in other branches of the business in a



Right of Way in Umpqua National Forest, Oregon

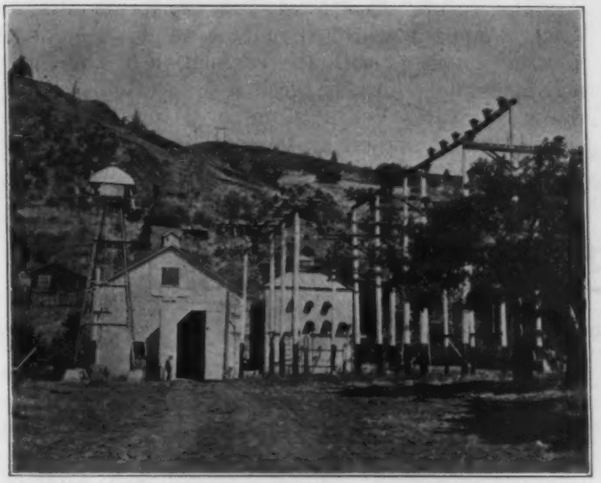
Forebay of Copco plant on the Klamath River (above) and (below) the Copco dam and power house which has two generating units, with a total capacity of 25,000 kw.

Pole Construction in Medford, above; below, Prospect to Springfield line.

Beaver Portland Cement Co., Gold Hill, Oregon, with 1800 hp. in motor load.

way to bring greater returns than in a power plant competing with central station power.

The California Oregon Power Company furnishes power to some twenty-five lumber mills and box factories, the greater number of which use this power exclusively, the others using it in connection with their own steam generated power. The company furnishes power, with only one or two exceptions, to all of the lumber mills and factories within reasonable reach of its lines. Its business from this source has steadily grown until now it represents a very important division of its power load.



Fall Creek power house and switch structures

Irrigation by Electric Pumping

Irrigation by electric pumping has grown very rapidly, increasing over 500 per cent during the period under survey, and this load is still growing and will continue to grow. Prior to 1912 there was no irrigation by electric pumping in the territory. In 1916 this amounted to a connected load of about 750 kw. and in 1921 to a connected load of nearly 5,000 kw.

Irrigation load in this territory is not as desirable as it is farther south, as the season is shorter and the annual load factor poorer. This is especially true of the Klamath Falls section, where the altitude is around 4,000 feet above sea level. However, irrigation by electric pumping is a very material factor in developing the country and brings in its train increased population and larger and more prosperous towns, which in turn increase the more profitable business of the power company.

This being a mountainous section, there is considerable irrigation by gravity and where this can be done more economically than by pumping, it is encouraged by the company. However, it very frequently happens that pumping by electricity works out cheaper in the long run than the gravity system. The company has one consumer who discarded a gravity system, installing instead a 50-hp. electric motor. This was because the maintenance of his seven miles of ditch was more expensive and its operation far less reliable than the use of an electrically operated pump.

The company has contracted with the Grants Pass Irrigation District to supply power for 900 hp. in electric pumps to lift water from the main line ditches of the irrigation district to high line ditches. By this means a large additional acreage will be brought under irrigation and the cost of water per acre of the whole project will be materially reduced.

These two cases are mentioned simply to illustrate the fact that electric power pumping may frequently prove more economical than a gravity system for irrigation. In almost every case the capital investment per acre is considerably less.

Interconnection with Other Companies

In addition to supplying its own territory, the company furnishes power to the Pacific Gas & Electric Company on the south and to the Mountain States Power Company on the north. The connection with the Pacific Gas & Electric Company was made in 1919 under the auspices of the Railroad Commission of California, and a contract was entered into, under the terms of which The California Oregon Power Company supplies 8,600 kw. to the Pacific Gas & Electric Company. The connection with the

Map of The California Oregon Power Company stations and transmission lines in southern Oregon and northern California

Mountain States Power Company was made on Nov. 1. The company recently constructed a 124-mile transmission line from its Prospect power house to Springfield, Ore., for the purpose and increased its generating facilities by the installation of an additional 12,500-kw. unit in its Copco power house on Nov. 5, raising the Copco dam some 15 ft. This line is constructed for ultimate operation at 110 kv. and for temporary operation at 66 kv. The company has entered into a contract with the Mountain States Power Company for a period of thirty years to supply the power needs of the latter company. This company furnishes power through the Willamette Valley as far north as Dallas, Ore., there being only a twelve-mile gap between this point and the lines of the Portland Railway Light & Power Company at Salem.

With the completion of the line from Prospect to Springfield, connecting the systems of The California Oregon Power Company and the Mountain States Power Company, the interconnected Pacific Coast power systems now extend from near the Mexican border almost to Salem, Ore.

The future growth of The California Oregon Power Company's load should be at an accelerated rate, inasmuch as with the completion of the Prospect-Springfield line connecting the systems of the Mountain States Power Company, the population served from the power system of The California Oregon Power Company has been practically doubled.

Service That Builds Business

By J. E. Bullard

IN ALL parts of the country that have been settled very long one runs across retail concerns that have been in business for a hundred years or more and that have been uniformly successful from the day they were founded. It is interesting to study these concerns, their methods and their policies to learn if possible the secret of their success and long life.

There are a number of things that these concerns do not do. For example, the writer has never yet been able to find a concern a hundred years old that makes it a practice to cut prices. These concerns do not make extravagant statements in their advertising, or promises they cannot keep. They give good values but as a rule let other people do most of the talking about this rather than talking about it themselves.

One thing these stores always do is to serve the community in which they are located. They

serve these communities in a little different way than other stores. Usually they serve them better.

A hardware store in a little city of 11,000 population, as an example, carries in stock a great many things that people are not able to find in any other store. It carries nothing but reliable goods and if anyone buys anything there, which for any reason is not satisfactory, that store wants these goods returned. Rarely, however, does this happen because the stock is purchased with the greatest possible care and examined thoroughly before it is placed on sale.

If the electrical contractor-dealer were to base his policy upon the same principles that have made this and other stores exist so long and make a good living if not good sized fortunes for so many men, he would go about it somewhat as follows: First of all, he wouldn't worry very much about what his competitors are doing or the prices they are quoting. He would devote all his time and his energy to seeing that his customers are satisfied.

If for any reason he lost a customer, he would find out if possible why he lost that customer and would spare no effort to get him back. As a matter of fact he would give a great deal more attention to holding old customers than to securing new ones.

He would do this because he is building for the future. He would realize, to take the case of a newly married couple who purchased some appliances from him for their new home, that rendering them service which would give them entire satisfaction and cause them to trade with him all their lives, would lead to new customers from that same family.

If he satisfies these people, if he gets them into the habit of relying upon him and of buying their electrical appliances of him, their children when they grow up will be very likely to trade at his store.

Suppose that this family has two children. In twenty-five years from the date of the first sale they will probably have homes of their own. By satisfying the old customer he has gained two more. He now has three instead of one. In another twenty-five years, if each of the two new families has but two children, he has six customers in place of the one with which he started, assuming that the original customers have passed on to the next world.

Service That Satisfies Pays

Rendering entirely satisfactory service has resulted in six customers in the place of one, without any special effort to secure new ones and without going outside of the original family. Of course, if the first customer was satisfied, that customer will have been influential in securing new customers

among his friends and relatives. However, we will leave that entirely out of the case.

If the first customers of the contractor and dealer have larger families, if for example they average three children each, then in twenty-five years the number of customers from this family has increased to four and in fifty years, assuming that the original customers have died, the number has increased to twelve.

These figures show one way in which the old concerns have grown. By being able to hold the trade of the original customers, they have been able early in their life to form the habit in the next generation of trading at their stores. Since the habit has been formed early in life it becomes firmly fixed.

By the third generation it usually becomes almost a tradition in the family, so when we examine the business of the oldest retail institutions in the country we find among the customers the grandchildren, the great-grandchildren and possibly the great-great-grandchildren of the original customers. Such a store need have little fear of competition as long as it can satisfy its customers.

The electrical industry is not very old. Forty years ago it was hardly in the bell wiring stage. Therefore, there are no really old concerns in this industry, yet there are a goodly number which are so well founded they will go on for generations.

Among these one does not find price cutters, or those featuring all kinds of bargains. They are the concerns that have been doing the very best work at a fair profit and that handle only the most reliable goods. These concerns will buy nothing that does not measure up to a high standard. They will not do a job of wiring that will not stand the test of time and continue to give satisfaction just as long as it is possible to make such a job give satisfaction.

Follow Up the First Sale

These concerns keep track of their customers and follow them up. They do not let a single customer, no matter how small, get away from them without making a determined effort to hold him. Every decision that is made must be one that will result in a favorable effect upon the business years hence as well as at the present. In other words, the effort is to build solidly and safely rather than to build rapidly, and usually the growth is very much more rapid and it always is more certain than where the policy is to let the morrow take care of itself.

These electrical contractors and dealers are not patterning their policies after what others are doing. They adopt high business ideals and adhere to them.

There are those in the electrical business who claim that during the past few years in the appliance end of the business too much attention has been given to making sales and too little attention to giving service. They give this as the reason why it has been so hard to maintain sales volume since 1920. This may be the reason (and it may not be the reason) why appliances have been so hard to sell since the period of falling prices began. There are a great many other factors that have entered in.

One thing, however, is certain, the appliance dealers who have given the greatest amount of attention to making the appliances sold serve the purchasers best, are those that are finding it easiest to sell them now. They are finding it easier because they have been careful to make each sale a foundation for a future sale.

Preparing for Future Sales

Some of these concerns, in fact, have laid the foundation for the appliance sales farther back than that. They have laid it at the time they have figured on the wiring of residences and apartments. They have sold a wiring job that, when completed, will make it easier for the appliances used to give all the results that are claimed for them. Some of these concerns have been willing to lose jobs where they were not able to convince the person having the job that it should be done right.

There is a saying in business that perhaps has not been emphasized to the extent that it should. It can be expressed as follows: "The concern that keeps grasping for business will eventually be gasping for business."

Reaching out for new business is an exceedingly expensive proposition, it is so expensive that it will

surely prove ruinous unless the old customers are first satisfied. One reason why the cost of living is so high is that many concerns are losing old customers.

A person who discontinues doing business with one concern must spend valuable time shopping around trying to find another that will give him satisfaction. A concern that loses the trade of just one customer loses much more than the amount represented by that purchaser. It loses the trade of the descendants of that customer. It loses the good influence of that customer. It will probably have to secure a number of new ones in order to replace the lost one. It is losing a great deal of profit, it otherwise could have made.

Serving the old customers in such a manner as to keep them thoroughly satisfied always builds profit and it also lengthens the life of the concern rendering that service. To do this it is necessary always to give the old customers just a little more attention than the new ones, to give them the first attention.

One of the Edison company district offices showing appliances on display

Building An Appliance Load

By A. W. Childs*

SIXTEEN years ago the Southern California Edison Company found itself confronted with the problem of discovering and developing a market for its surplus hydroelectric energy. Today it faces the same situation. Back in 1906, just as today, the home, agriculture and industry comprised the outlets through which this energy must flow. Today the company is turning to the home for the absorption of this surplus with the expectation that during 1923 it will place on its lines a minimum of 1,500 electric ranges and 500 electric water heaters. Sixteen years ago the company turned to the domestic consumer and through an intensive educational and merchandising campaign built up a highly desirable load. At that time a careful consideration of the factors involved convinced the company executives that the so-called "lamp socket" appliance and the motor were the media through which the surplus energy could be absorbed. Less than two years were required to prove that the appliance was designed to be the controlling factor in this load-building process. This conclusion was based upon the premise that the domestic load was very desirable, first, because of the possibilities for its development due to the great number of consumers, and, second, because a domestic appliance was an off-peak load—one which tended to increase the load factor and fill in the valleys in the load curve.

The situation in the industry in 1906 was such that the central station itself was required to assume the task of placing these appliances in the home. Educational work was necessary and the power company seemed to be the logical agency for the distribution of the appliances. In consequence, a definite merchandising policy was adopted and a vigorous sales campaign instituted. Some of the initial steps taken by the company are interesting. It was estimated that the income from an electric iron was approximately $6 per year with the rates which existed at that time. In order to introduce the electric iron among its customers the Edison Company purchased and loaned 10,000 irons for a stated period of time, allowing the customer the right to purchase the iron provided it proved satisfactory. Within twelve months or so, 90 per cent of the irons were sold to the women to whom they were loaned. This was followed by an offer to consumers to make an allowance on old sad irons taken in exchange on new electric irons. This worked out so well that the same plan was adopted to introduce the electric coffee percolator. An allowance was made on old coffee pots. Thousands of irons and percolators were sold as a result of the exchange offer.

Merchandising Methods Successful

In ten years the company, through its merchandising department, disposed of many thousands of appliances to its customers, the sales some years reaching a total of 30,000 appliances. The load climbed as was desired, and the load factor gradually increased. Office displays were maintained, merchandising experts employed and advertising campaigns promulgated. Often as many as 30 canvassers were in the field at one time.

The situation reached a climax in 1917. Conditions developed among the dealers and jobbers which resulted in a general discussion of the subject

*Manager, Commercial Department, Southern California Edison Company.

by the industry at the Riverside Convention of the Pacific Coast Section of the National Electric Light Association that year. At this meeting the central station explained its attitude on the question of merchandising. It mattered not to the company who sold the appliances so long as they were sold, officials explained. As as result of this meeting the Edison company modified its appliance sales efforts. It reserved the right to display appliances in its offices and sell them to those customers who made inquiries, but it ceased to solicit sales from house to house. The dealers were given the privilege of also displaying appliances in the company's district offices and in many instances the central station's own displays were placarded with the information that the appliances could be purchased from any of the community's electrical dealers.

This arrangement has proven satisfactory in the main. The appliance load has continued to grow. However, there has been one weakness, in particular—the development of the market for electric ranges and water heaters. The fault does not lie entirely with the electrical dealer. In the past the problem of placing the electric range in the public's kitchen has been approached from a merchandising

Each of these sad irons was replaced by a more modern electric iron

standpoint. The electric range offers a problem of sales promotion, at least until such a time as a desire for the range has been created in the mind of the public, and cannot always be handled by ordinary merchandising methods. From a revenue producing standpoint the range is a most valuable adjunct to the power company's line and as such it should be pioneered by the company.

Cooking and Heating Load Desirable

In further considering the meritorious points of the cooking and heating load, some consideration should be given to the value of this service to the public. The value to the public of cooking and heating by electricity as compared with other fuels, arises chiefly from the factors of convenience, cleanliness, safety and comfort. Its greatest appeal should be in those districts which are not supplied with gas as fuel. However, it is evident that even in competition with gas, electricity has its advantages. It is far more economical than gas so far as the question of food conservation is concerned.

The proposal of the Southern California Edison Company to add 1,500 electric ranges and 500 water heaters to its lines during 1923 by means of an active sales campaign takes on a new interpretation in view of the foregoing sketch of the merchandising activities in the past, and the present situation with regard to load demands and the range market. Moreover, the company is in a position to benefit from past experience for in the two years preceding 1918, a total of 3,000 ranges was placed on the lines as a result of a range campaign.

Contractor-Dealer to Benefit

In outlining the sales campaign, the contractor-dealer has been given due consideration, for it will be his task to take over the sales when the demand has reached the point where promotional work will no longer be required. The dealer has proven his worth as a merchandiser of socket appliances and his lack of success in merchandising ranges cannot be held against him. Different sales methods were necessary — methods entailing heavy expense. The profit has been far too small and the cost of making a sale too great. Prices have also been against him for they have been too high. His financial position has been such that he could not profitably invest in a large stock. With the power company and the manufacturers backing an intensified range campaign, the position of the dealer will be improved. The central station is building for the future and the cost of the promotional and educational work involved in creating a demand for ranges and water heaters will not enter in, for each time that it adds a range to its lines it is assured of revenue for years to come.

The dealer will benefit from these activities, for the demand for ranges which is created will be reflected in an increase in his range sales. With a reasonable amount of effort he can tie in with the campaign in the locality which he serves.

The company will not engage in the wiring business, leaving that entirely to the contractor. A plan has been evolved whereby a flat price will be quoted for installing the range. Contractors have been asked to submit an average price for a range installation and this will be quoted except under extraordinary circumstances. The company will not profit from the wiring job. The amount of wiring business which will be involved in the installation of 1,500 ranges and 500 water heaters is considerable and the contractor-dealer will be the one who will profit.

Insofar as the central station is concerned, the task is not strictly one of merchandising but one of education. We are seeking no merchandising profit. We are building for the future. The plan as outlined is one which will demand cooperation from every branch of the industry and one in which the entire industry will benefit. The central station company developing hydroelectric energy in great quantities, must find a market for the product, and the electric range points the way to a practically unlimited field which only needs cultivation to yield a satisfactory harvest.

ELECTRICITY IN INDUSTRY

By Louis F. Leurey
Industrial Electrical Engineer

Illumination of Quarry and Tramway for Night Production

AT THE plant of the Old Mission Portland Cement Company at San Juan Bautista, Calif., it became necessary to carry on a certain amount of quarry operations at night in order to meet the requirements of increased production.

In the development of this quarry, the rock was taken out by means of tunnels and traps underneath the quarry face, and cars from these tunnels dumped into a loading hopper near the lower end of the quarry face. From this hopper, a gravity tramway extended 1,200 ft. to the main railway line at the foot of the hill.

To handle production successfully at night, it was not only necessary to illuminate the quarry but was also necessary to illuminate the 1,200 ft. of tramway so that operators at the top of the hill could clearly see the cars the entire distance to the bottom.

The lighting of the quarry was handled by planting 500-watt General Electric projectors in the foot of the slope with quick removable attachments so that they could be moved to a place of cover before each round of blasting. With this in view the projectors were mounted on a simple board which could be propped into any desired angle quickly and it was of sufficient lightness to permit of its ready handling during each blast. The projectors were selected with a medium angle of diffusion so as not to have too much intensity when the quarrymen are facing down hill.

The whiteness of the rock face lent itself very readily to the method of illumination.

The lighting of the tramway line introduced a somewhat special condition as it was situated on a very narrow strip and it therefore became necessary to select a unit having a maximum coverage along the axis of the tram and a minimum across the tram. Benjamin Parabolite reflectors were selected for this work and were mounted on poles at approximately 100-ft. intervals down the length of the tram.

Advantage was taken of the sloping ground in hanging these reflectors so that a positive cutoff was secured on the uphill side, thus permitting the operator to get a clear view of the cars without being troubled by the glare of the lighting unit itself. This installation has been entirely successful both from an illumination and a safety point of view.

Advantageous Publicity Through Use of Flood Lights

IT IS becoming more generally recognized that one of the most effective and pleasing forms of publicity for public structures and for high-class industrial buildings, is to make use of well-designed spectacular illumination so that the buildings give a most attractive appearance during the evening hours and thus secure the attention of the general public to an extent not possible during the ordinary business hours of the day.

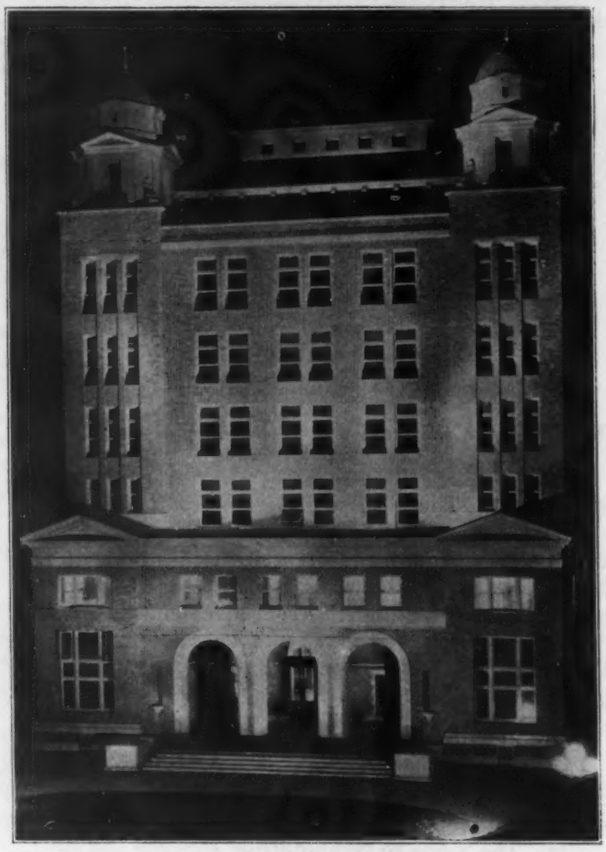


Fig. 1—City Hall, Long Beach, Calif.

There are two distinct methods by which this can be accomplished and the accompanying photographs show typical examples of what can be done in each class.

The exterior of the city hall of the City of Long Beach, Calif., is shown in Fig. 1. The flood lighting was done under the direction of C. M. Masson, as a demonstration by the local power company for the benefit of the City Commission of Long Beach. The effect was produced by the use of Western Electric Davis flood lights mounted at points where they would not come within the line of vision of the passers-by. This particular effect has been excellently planned, by well directed angles of projection, and by varying fields of intensity, thus producing sufficient shadows to secure full architectural definition.

One of the most frequent mistakes made in the employment of flood lighting on the face of public buildings is to make it so intense and uniform in character as to wipe out all architectural outline and thus render the effect flat and lifeless.

A photograph of the flour mill of the Sperry Flour Company at Ogden, Utah, is shown in Fig. 2. This mill has the reputation of being one of the best lighted industrial plants in the country. From the basement to the tower every floor, regardless of its uses, is illuminated by dust and vapor proof lighting fixtures, thus insuring the maximum of personal safety, of absence of eye fatigue, of cleanliness of mill and product, an an increased over-all efficiency of the employees due to the mental alertness produced during the night working hours.

On the main floor of this flour mill, the vapor proof units are of the Benjamin refractor type which taken together with the secondary value of white walls, produces an intensive and spectacular quality of modern illumination. As will be noted in the photograph, the entire wall area other than the space occupied by the columns and pilasters consists of steel sash, and there has been no attempt in the interior illumination to secure the window effect produced. The effect is solely the result of the employment of sufficient intensity of illumination for good milling purposes plus a white painted interior and the use of refractors of the vapor proof type over the lighting units.

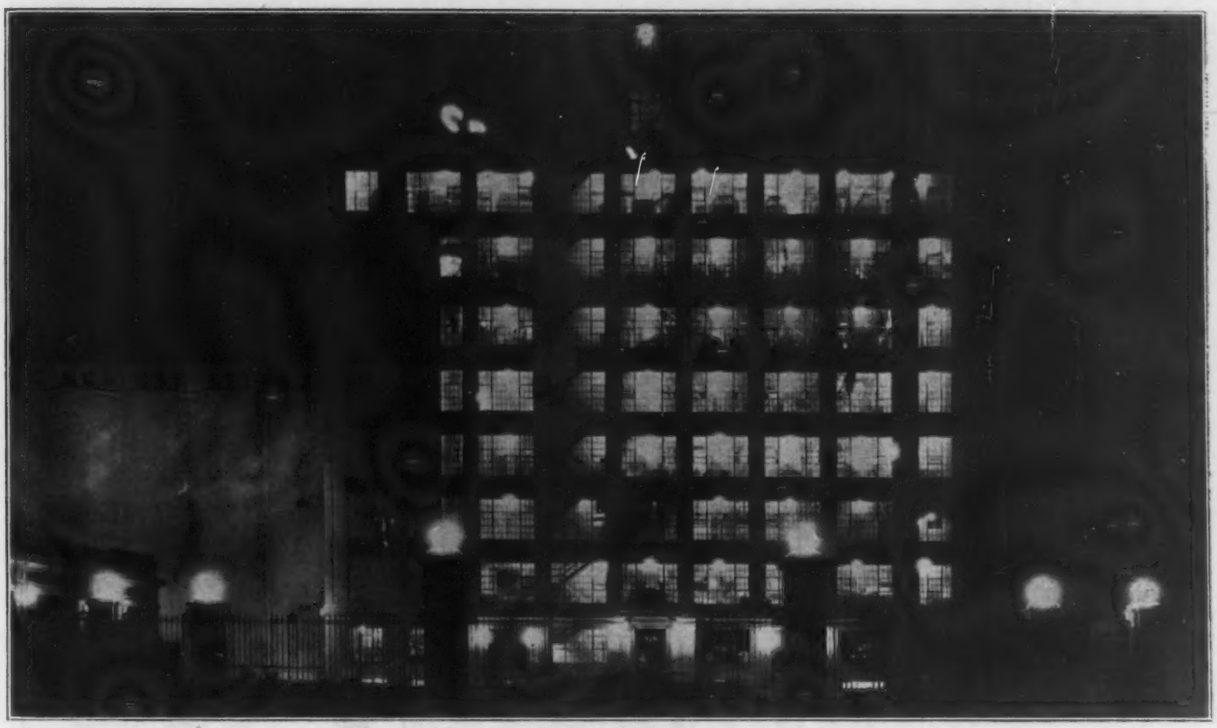
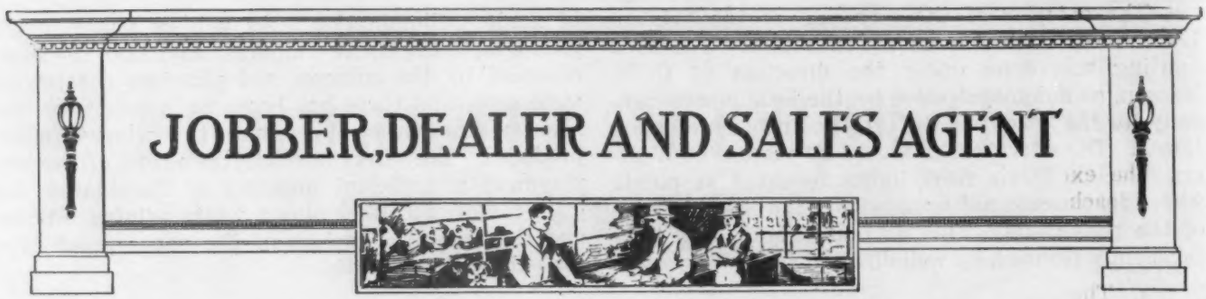


Fig. 2—Ogden mill of the Sperry Flour Company

This mill has been architecturally located with a well designed court yard opposite its main entrance at the end of Sperry Avenue, so named by the citizens of Ogden as a recognition of the progressiveness of the Sperry Flour Company in putting up an industrial building of this high quality.

In the case of the Sperry Flour Company, only minor efforts are made to illuminate the exterior of the building. The grain elevators are lighted by very few flood lights, the purpose being to enable men arriving with loads of wheat to see their way more easily. The reflected light from these white surfaces furnish sufficient illumination for this purpose. The electroliers in the foreground of the accompanying photograph are located at the entrance to the grounds occupied by the flour company and are purely for decorative reasons.

Industrial companies are now learning to realize that by putting up buildings of this quality and bringing them into prominence by such high-class methods, they are securing a quality of publicity and a fund of good will which is invaluable in their business.



Helping the Electrical Dealer Sell His Merchandise

Two Months' Advertising Campaign Conducted by Los Angeles Jobber to Stimulate Sale of Appliances

Advertising, the same as selling, falls into two general classes, the creative or constructive, and the destructive. The first builds business for every one and creates good will for the industry. The second, based on selfish motives, tears down this good will and gives nothing in return. The salesman who first sells the idea behind his product and then tells why his product is superior to others, obtains more business than the one who begins his selling talk by damning the products of his competitors. This same principle is applicable to advertising.

The electrical industry during its development and growth, has furnished many examples of constructive advertising, not only in the campaigns of individual manufacturers, but also in the cooperative advertising campaigns which have been instituted in various localities for educating the public in electrical methods. The advertising campaign which is being undertaken by the Los Angeles branch of the Western Electric Company in southern California and the Pacific Southwest at the present time demonstrates the high principles which actuated the electrical industry in all of its past activities.

The status of the electrical industry at the present time is such that the advertising which it puts forth must sell the electrical idea. The industry is yet in its infancy and those with goods to be sold recognize the fact that while the public is in a receptive mood toward electrical household appliances, there is still much educational work to be done. The Western Electric campaign has been evolved with this in mind. While the copy has been prepared with a view of selling the manufacturer's name, the principal message it carries is primarily the electrical story—what electrical appliances can do to better the living conditions in the home.

The campaign consists primarily of a series of seven small "teaser advertisements," followed by eight full pages in the Los Angeles Examiner. It will extend over a period of approximately two months, ending just before Christmas with a series of advertisements directed toward the Christmas shopper. In addition to these advertisements, a total of fifty-six billboards in and around Los Angeles are being used to put over the message.

The company has based its campaign on the premise that the proper function of a jobber is to assist in the education of the public through advertising, and in fulfilling this function, it is committed to the policy of selling the electrical idea through the medium of publicity as well as supplying its dealer-customers with a complete sales promotion service. The company's operations are based on the belief that the contractor-dealer is entitled to a reasonable return for the distributing and selling function which he performs and in consequence it attempts to encourage the sale of its products to the consumer at prices which will net a fair margin of profit, through such channels of trade as will render a measure of service calculated to increase the use of electricity.

One of the features of the campaign was the series of "teaser" advertisements which have already been run. The ads consisted of a reproduction of the old-time servant girl which is appearing in the national advertising of the Western Electric Company at the present time. The reason for the teaser ads was this: Given an advertising campaign, a certain amount of waste circulation must be deducted from the regular circulation of the advertising mediums in the concession that naturally not every reader of the paper reads every advertisement. The creation of mystery or suspense in the form of teaser advertisements has the effect, then, of increasing reader interest, for nearly every person who sees the teas-

Washing's done—Play time, now!
Western Electric Clothes Washer
Has Won Another Day of Leisure
They Are Easy to Acquire—
See Your Dealer Today
Western Electric
Since 1869 (53 Years) Makers of Electrical Equipment
"Everything Electrical"
301 East Eighth Street
Los Angeles
The Western Electric Family of
Six Electrical Household
Appliances to Save Labor.
Remember the old-time Servant Girl of 20 years ago? Dependable, cheerful—always hard at work. This work she used to do can now be done in every way as well, and in some respects better, by the six Western Electric appliances.

A sample of the copy which is being used in the newspaper campaign

ers is practically sure to look for the solution in the advertisements which follow. Having seen the teaser advertisements, it is safe to assume that an amount of interest that will carry-over to the succeeding advertisements has been engendered, and the ads which are to come will be read.

The "Servant Girl" which features the first of the series of advertisements represents a symbol of the service which modern electrical household appliances are able to provide in the home. "Remember the old-time servant girl of 20 years ago?" is asked in every advertisement in which the cut appears. Some of the messages which appear in the teaser advertisements which feature this servant girl idea follow:

"In my day, work was spelled the same way as now—but it was done by hand."

"It has taken a generation of science and a worldful of engineers to make machines to do housework—but they do it better than I did."

"You may paddle your own canoe, but you don't have to pedal your sewing machine. ——— does it quicker and better."

"When I was young housework was a drudgery, requiring long, weary hours. Today it's done by ——— machines—even dishwashing."

"How to live twenty-four hours a day: Do your housework the ——— way—see page advertisement in tomorrow's Examiner."

The copy which follows is written to carry the message that electrical appliances can do all the work the old-time servant girl did, and do it better, quicker and more economically without the necessity of having the girl herself around. The effectiveness of this idea in bringing before the housewife the convenience of electrical household servants is evident.

It has been estimated that fully 80 per cent of the electrical household appliances sold today are purchased on an installment basis. In consequence all of the advertisements emphasize the idea that the appliances advertised are easy to purchase. "They're easy to acquire—see your dealer today!" is the final message on each advertisement.

Single Feature with Group Background

The group idea is also brought out in each advertisement. In all of them with the exception of the final Christmas spread, one appliance only is emphasized. Yet in every case all of the remaining appliances of the line are brought to the attention of the reader in a series of little pen-and-ink sketches and descriptions. The copy is written on the principle that fifty per cent of the work to be accomplished by the advertisement is the selling of the manufacturer's name while the other fifty per cent is the selling of the electrical idea. It is the dealer's part to sell the completely electrified home. When the dealer places the first appliance in the home, his task is half finished. At the time when but one more payment remains on this appliance he may call on the housewife and demonstrate to her the added conveniences which will come with another appliance. If the housewife has been thoroughly sold on the first she is in a far more receptive mood to listen to his sales arguments regarding the second. In this manner the task of placing the six major appliances in the home is easy.

The old-time servant girl, one of the important features of the advertising copy

Happiness is the basic theme of all the copy. More leisure hours, more time for social life and outdoors, less drudgery, are some of the things emphasized.

Tieing-in with the Dealer

The company has prepared a number of dealer tieups for the campaign. Included in these is a series of booklets on each of the six appliances advertised, which may be included in statements, passed out over the counter or mailed to prospects. Window display material and counter display material has also been prepared for the dealers. Full-page reprints of the various advertisements as they appear will be furnished with the dealer's name imprinted for use in windows or for distribution.

It is expected that this campaign will not only increase the sale of the products of the Western Electric Company but also will be of inestimable value to the entire industry. With the approach of the Christmas holiday buying period, any advertising which will tend to bring the electrical idea before the public eye will aid in the selling of electrical appliances irrespective of the make. Dealers will benefit also for their sales will be increased with no cost to them. On the whole the campaign is one of the largest of its kind ever undertaken in the West.

The smell of Christmas is quite as important an element in the psychology of the Christmas spirit as the sight of lights and colored balls. Christmas greens not only add a festive appearance to either the outside or the inside of the store, but they lend the fragrance of pine woods which combines with the display of shining nickelware to convey the idea of Christmas giving.

Christmas gifts that bring daily happiness!
What a joy it is to give the right thing; to know it's right, that it will last, that it will keep on giving happiness, unremittingly, for almost time without end! You'd give her—the sweetheart you married—that sort of Christmas gift, if you could find it, wouldn't you?
HERE'S HAPPINESS! Western Electric's six faithful electrical servants—ironer, clothes washer, electric range, vacuum sweeper, sewing machine, dishwasher and kitchen table—the highest type of Christmas gifts.
See in the picture how joyously Mrs. Home-maker hails upon the untiring and quiet home servants her husband has presented her.
Now she is going to have an ALL-YEAR-ROUND CHRISTMAS—year after year. Every day she is going to have a chance to appreciate these splendid gifts. Golden hours of leisure will be hers; she is going to have time, ease, for tennis, for mastering her bridge, for enjoying Southern California's great outdoors, for going through the strange grottos up into the mountains and frolicking with other fortunate folk at the snow carnivals.
See how happy Mr. Home-maker is! He's discovered one of the big pleasures of life—the smile of a joyful sweetheart, from whence mind vision of tomorrow days has been erased.
Real Christmas presents, these. Has more dreadful whose usefulness is quickly outwrought, or whose novelty is over a here.
And not expensive, either, for within a year or so they've paid for themselves and after that they give back dividends day after day in economy, time and more pleasure.
Western Electric provides the entire six silent electrical servants, capable as the old-time servant girl, more thorough, less expensive. Western Electric servants adapt themselves, to tasks as far apart as dishwashing; cleaning the automobile, and the corners of the cellar.
Here are the six Western Electric faithful electrical servants:
THE WESTERN ELECTRIC CLOTHES WASHER AND WRINGER does a week's wash in a small portion of the time it takes the ordinary, hand-scrubbing, back-breaking way. The clothes, revolved about by the revolving cylinder, come out spotless. No scrubbing—no clothes lost hanging!
THE WESTERN ELECTRIC IRONER does a week's ironing in a touch of the small coin. Sit or stand, as you please, in front of the ironer, and ply the pieces under. Even collars are ironed by the Western Electric ironer! And the pieces retain a glossy finish and won't get by hand.
THE WESTERN ELECTRIC VACUUM SWEEPER makes unobtrusive home-cleaning a veritable pleasure. The motor-driven brush helps loosen obstinate embedded dirt, dust and lint and the powerful suction draws it into the valve-sealed bag. Rugs, upholstery, portieres, difficult corners, are easy to the Western Electric Vacuum Sweeper.
THE WESTERN ELECTRIC DISH WASHER AND KITCHEN TABLE washes practically and efficiently the task of washing the dishes.
THE WESTERN ELECTRIC SEWING MACHINE takes all the burdensome care of sewing, it's as easy to control with the foot, and there's no ankle to push.
THE WESTERN ELECTRIC CRAWFORD RANGE gives one a better oven and a cooler kitchen. It cooks the roast, and not yourself. It makes food taste better, too!
If you prefer, get one or two Western Electrics at first, adding the others later
They're easy to acquire—See your dealer today!
Since 1869 (53 years) makers of electrical equipment
Western Electric
301 East Eighth Street "Everything Electrical" Los Angeles

The last advertisement of the series, emphasizing the happiness idea of Christmas Day

Scenery: Like this compensated for hardships—

After the first wreck.—All Hands Out!

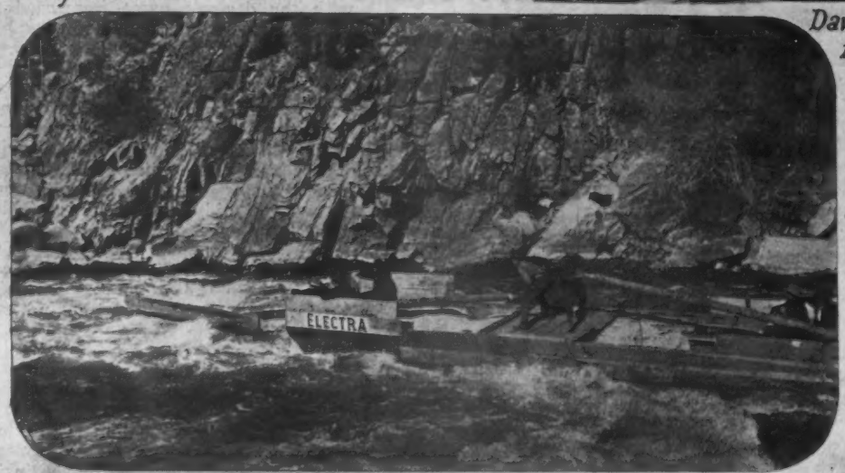
WILL, STUBBS, SANDERSON, PETERSON, BACH, AVERILL, DEMING, LITTLER in a moment of Relaxation

GUY LITTLER ~ Official Photographer

Floyd Averill

Down a River of No Return

Dave and Fred the Boatmen in Action

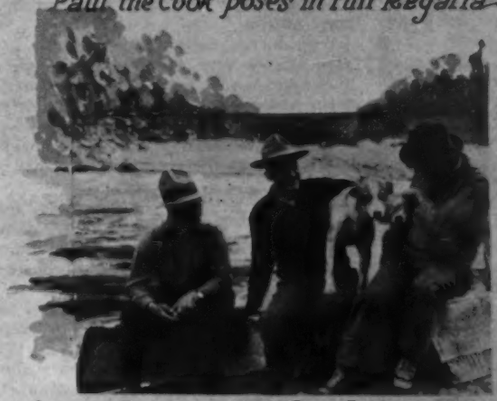


A tense moment—Running the Dump Creek Rapids.

"SANDY"

Paul the Cook poses in full Regalia

Reminiscent of the Grand Canyon



STUBBS, PETERSON, TIGE, PAL, SANDERSON

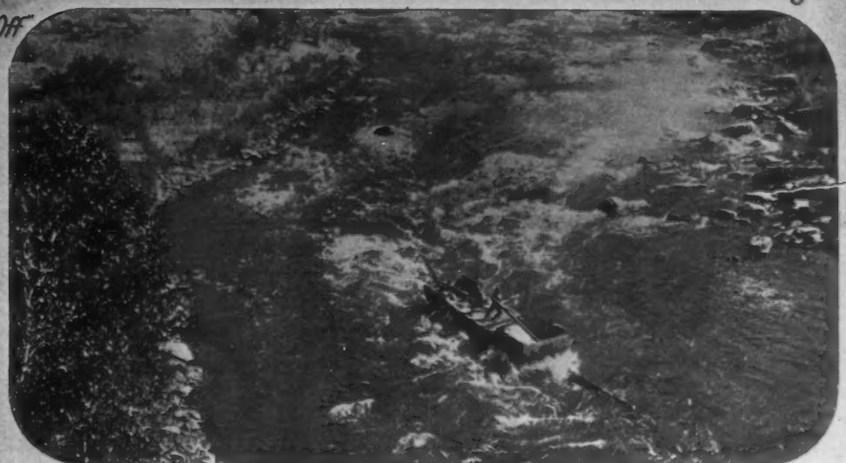
At Riggins, Oct. 21, the End of the Journey described on the following Page

The Cruise of The "Electra"

Bill Deming

At Salmon, Ready to Shove Off Sept. 28

"PETE"



Whitewater and Plenty of it Made Life Interesting

Electrical Men Return from Trip Down Salmon River

ELECTRICAL men are often thought of as pioneers in business and power development and adventurers and explorers in the realm of science, but it remained for eight intrepid westerners to establish themselves as explorers and adventurers in one of the few remaining wildernesses in America. The adventure which admits them to fame, pictures of which are shown on the two preceding pages, was a 175-mile journey by boat down the Salmon River, in Idaho, from Salmon City to Riggins. The intrepid explorers, all well known in the electrical industry in the West, are as follows: F. N. Averill, president, Fobes Supply Company, Portland; C. R. Bach, Pacific Coast manager, Manhattan Electric Supply Company, San Francisco; W. M. Deming, president and general manager, Atlantic Pacific Radio Supplies Company, San Francisco; Guy Littler, president, West Coast Engineering Company, Portland; S. W. Peterson, general manager, Stubbs Electric Company, Portland; H. E. Sanderson, Pacific Coast manager, Bryant Electric Company, San Francisco; O. B. Stubbs, president, Stubbs Electric Company, Portland, and C. M. Will, manager, Fobes Supply Company, Portland.

Expeditions of this nature have been a biennial event with these men for a number of years, but this trip is by far the most hazardous and adventuresome. Three weeks were consumed in traversing the 175 miles of river, due to the unusually low water which made the rapids exceedingly treacherous. The boat "Electra," which was a flat bottomed affair about 30 ft. in length, was wrecked four times. And although the party subsisted on bacon and "dough-gods" for the last two days, due to the boatman having inadvertently thrown the rations overboard with the stove during an impending wreck, no serious accident occurred.

H. E. Sanderson, in discussing the trip, remarked, in part, as follows:

"If you should become enthused to the point of wanting to take this trip, hesitate and take the word of one who knows from experience that this is no country for a tenderfoot. To the Nez Perce, Shoshones and that renegade tribe of Sheepeater Indians it was probably Paradise—to the unsuspecting tenderfoot, it is just the opposite, so again pause—and take my advice—when you want a river trip confine it to one of the many placid streams which run through civilized country.

"We went into this country with the idea that we amounted to something, but after the river got through with us we realized that we were next to nothing in the big scheme of the Universe. We left the small cattle town of Armstead, Mont., on the Gilmore & Pittsburgh (known locally as Grief and Pain) Railway for Salmon City, Idaho, 95 miles away, at 8 a.m., and after a rapid journey of ten hours reached Salmon at 6 p.m.

"At Salmon we had a boat built for us for the trip down the river. This was to be in charge of a riverman by the name of Smith. When we boarded the train at Armstead we found several natives of Salmon on board and being interested in the men who were to pilot us on the river, we began to ask questions as to the ability of our boatman. Our enthusiasm received a jolt when we were informed that they had never heard of Smith and that a Captain Guleke was the only man who had ever successfully navigated the Salmon River and incidentally that everyone else who attempted it left their boat and their mangled remains strewn through the rapids. One of these natives, who was full of statistics and moonshine, told us that each of the many rapids has claimed at least a dozen men, so by the time we reached Salmon our morale was somewhat shattered. From Ledore to Salmon we went through a wonderful valley which abounded with ducks, geese and sage-hen, with a fine trout stream following the valley. We eventually reached Salmon and found a little town of 2,500 inhabitants, also that our boatman, Smith, had mixed with a bandsaw two days before and had come out second best in the argument, being mussed-up so badly that he could not make the trip. However, we engaged another man to handle the front sweep, who, we were informed, was an old experienced river man, but who had not run the river for ten years, and as the channel and rocks are changing each season, we had visions of a rough voyage.

"We were naturally interested in the boat which was to be our home for the next two weeks (some of the boys, I think, felt that it might be for a couple of years), so we all went down to the river and there was our boat looking like an ocean liner, 32 ft. long, 8 ft. wide, and drawing about 10 in. of water when fully loaded. After inspection we christened her "Electra," breaking a bottle of something over her bow not a drop of which was wasted, as we discovered some of the boys had provided themselves with sponges for just such an emergency.

"After supper we met our crew, Dave Sandalinds and Fred Bransted, and they looked like 'he-men'—and believe me they were—as it proved afterwards on many occasions.

"The next morning we loaded and while doing so listened to several of the natives whom I imagine were undertakers, as their one topic of conversation was 'sudden death' and 'how the river got them.' If my knowledge of the English language enabled me to spill it with the abandon of an Albert Elliot, I could write volumes on the scenic wonders of the trip, but why waste time when the pictures speak for themselves and show this country to be a combination of the Grand Canyon, Yellowstone Park and Yosemite Valley?

"It took us about half an hour after leaving Salmon to get into real wilderness and the rest of twenty days to get out of it, and after we disembarked at Riggins, Idaho, 175 miles down the river, we were still in the wildest country left in the United States."

THE CRAB CLASSIFIED

By JOE OSIER

And the wise man lifted up his voice and spake thus:

"The daughter of a crab does not give birth to a bird." And I—poor scribe that I am—

In an effort to earn my cakes this day—laboriously lift and lower my fingers on my typewriter in an attempt to gild that—

Lulu of a proverb above reproduced.

"The daughter of a crab does not give birth to a bird," nor does a crab in the electrical or any other industry beget new customers nor for long hold his old ones.

A crab is a crab in any language. In business, he is the man who spends all of his waking hours in "cussing" conditions, knocking the business, hating his competitors and—

Ringing up "No Sale" on the cash register.

He is the Fish who clambers on the housetops and tells the World that—

Publicity is all bunk—advertising is a waste of money and that—

Quality and Service "never got nobody nothin'."

You have seen him in action, I am sure. Like any other crab, he crawls backwards and he drags his business after him; drags it into a dark hole and pulls the hole in after him—and—

It always takes a sheriff, a receiver and 40 indignant creditors to drag him out.

The crab will not concede that "Good and evil are rewarded at last—though we travel far and high there is no escape." In fact, the crab in business will believe nothing, except that—

He and his ways are right and that the rest of the World is out of step—but—

Glory be to Allah, Abou Ben Adhem, Rodolph Valentino and the rest of the prophets—

A crab, like a yellow journal, is always wrong.

Quite recently, one of the few crabs in the electrical game in my town said to me:—

"Why should I give you a story about my business? Why should I give you a picture of my shop? Why should I tell you how I sell domestic appliances? Why should I waste my time reading trade journals?"

And, when I got the dice, an hour or two later, I said this and left him flat:

"Friend, there is lots of work to be done in this World and I am supposed to do a fair portion of it. Today I am especially busy. There are many bright men in your line who are waiting to see me and I am truly sorry I have taken up your time and wasted my own. My advice to you, freely given is—

"Strap on your climbers, shin up the tallest pole in town and stay there, else—

"Some day, you will be run over by a hearse."

I know and you know that one twig cannot for long dam a stream and that—

The play is bigger than the actors, and the men in the electrical industry who are walking in the light of intelligence and efficient conduct of affairs have the Dumb Davids—

Working "at" the business—

Outnumbered 1,000 to 1—so—

Why fret farther or waste more white space?

Page the bouncer and away with the wretches—

Let's Go.

Cooperating to Sell the Idea of Electric Cooking

Message of Cooking by Electricity Is Not Dimmed by Rival Salesmen in Telling Merits of Their Ranges

"Sell the idea of electric service for the cook stove and subject the relative merits of the products while selling the principle of electric cookery to the prospective customer." This was the motto of A. R. Wooley, of the Edison Electric Appliance Company and M. E. Lanning, Westinghouse Electric & Manufacturing Company representative, when they worked side-by-side in displaying the advantages of cooking by electricity at the Colorado Western Slope Fair held at Montrose, Colo., recently.

These two men, who have their headquarters in Denver, have realized that to secure success for the electric range, the public must be informed of the advantages of cooking by electricity instead of with the old-fashioned coal or gas stove. They felt that an educational campaign must first be conducted which will promote the electric range idea, as housewives are loath to give up anything which they have used, for a device which they have not been able to try out in their own homes. Not many years ago a woman in one of the western states refused to have her house wired for electricity, even though the central station offered to do the job at cost and supply the current for one dollar a month, because "a woman had been killed by electricity in New York."

This same state of mind, which tends to influence the housewife against trying a new article for herself, is present today in a modified form. The advantages of the new product must be shown before any attempt to sell any particular brand of that product can successfully be made.

Once that the idea of cooking by electricity is sold to the public, attempts to sell particular brands of electric ranges will prove successful. When the merits of the electric range, as an idea, are sold to the public, business for every member of the trade interested in the manufacture and sale of the ranges will profit. To secure this end, it is to the advantage of rival manufacturers, jobbers, and dealers to cooperate in selling the idea before any effort is made to sell any particular design of range. Attempts to market any product by criticising another similar device which may have a minor change in design, only tend to weaken the sales argument for the product, as such, and tend to prevent the purchase of either design.

A realization of this fact brought Mr. Wooley and Mr. Lanning to the point of cooperating at the Colorado fair to the extent that they cooked, baked and talked electric cookery together. Their work was to demonstrate the advantages of cooking by electricity.

The thousands of people who visited the exhibits at the fair were given an opportunity to watch electric ranges in operation. Bread was baked for their inspection, while the real advantages of the electric range were discussed by the rival salesmen. The relative merits of automatic controls, and sheath wire elements found in the respective ranges was a secondary consideration. The real message was selling the idea of electric cookery.

Christmas crowds who come in at the last minute and stand in line to be waited upon are the trial of every dealer. It is apparently impossible to provide clerks or floor space sufficient to handle them satisfactorily. One dealer solved this problem, not by adding more clerks on the floor, although of course he had as many there as could work advantageously, but rather by strengthening his organization back of the clerks, so that the man waiting on the customer need take as little time as possible with any one individual. There was always a boy at hand to take the order blank and article to the wrapping desk and follow it through, so that once the customer's wishes were satisfied, the clerk could go on to the next. Besides making more effective the use of the time of the higher paid salesman, this helped to solve the problem of the impatiently waiting customer, because it kept the salesman always in his sight—not continually disappearing into the rear of the store on business not clear to the man waiting his turn.

Motion in the window is always a drawing card. The Christmas window display offers special opportunities in this line. A Santa Claus sleigh which enters from one side of the window and moves swiftly across to an exit on the other, a toy train or a galaxy of gaily colored balloons kept in motion by an electric fan offer opportunity for a great variety of effects. In case the course of the train or sleigh or other motor-driven toy is too long so that there is an appreciable wait between the time it disappears and appears again at the other side of the window, it is a simple matter to have two riders, so that one appears just as the other is disappearing.

Buying presents for the man in the family is always the most difficult of Christmas tasks. The woman shopper will appreciate a window which features those electric appliances which make especially appropriate gifts for the father or brother of the family. Grouping the articles so that one corner represents gifts for father, one for mother, one the old person of the household and another the child, will suggest possibilities to the window gazer which might otherwise not occur to her.

A. R. Wooley and M. E. Lanning, working together to sell the electric cooking idea at the Colorado Western Slope Fair

INDUSTRIAL NEWS

Oregon Company to Have Highest Head Reaction Turbine

The contract for a 35,000-hp. vertical reaction turbine has just been awarded to the Pelton Water Wheel Company of San Francisco by the Portland Railway Light & Power Company for installation in its Oak Grove plant. The unit will operate at 514 r.p.m. under an effective head of 857 ft., making it the highest head reaction turbine in the world thus breaking the record established by the 810-ft. head 25,000-hp. turbines at the Kern River No. 3 plant of the Southern California Edison Company.

Before deciding upon the reaction type of turbine, engineers of the Portland company received designs for one 35,000-hp. reaction unit, two 17,500-hp. reaction units, and two 17,500-hp. impulse units.

The new turbine will resemble the Kern River units, but, as a result of cooperation between engineering staffs of the Pelton Water Wheel Company and its associated company, the I. P. Morris department of the William Cramp & Sons Ship and Engine Building Company, will embody a number of I. P. Morris features. Among these are the disk-type guide vanes, the Moody spreading draft-tube, and the Taylor grease gun. The newly-developed Pelton rubber seal rings will be substituted for the ordinary all-metal clearance rings.

The Oak Grove plant is situated on the Clackamas River, about 53 miles from Portland. The present development is the first unit of a project that will ultimately develop 100,000 hp. from the Clackamas and its tributaries.

Electricity will be generated at 11,000 volts and will be transmitted at either 66,000 or 110,000 volts. Eighteen and one-half miles of wooden pole line will be used to connect the plant with the main line from Cazadero station to Portland. Construction is to be completed early in 1924.

Returns by Counties on the Water and Power Act

Interest in the result of the election on the Water and Power Act, Amendment No. 19 on the ballot in California, is attested by the number of inquiries received by the Journal of Electricity and Western Industry for complete returns on this measure. Since official returns will not be available until Dec. 15, a canvass was conducted which is shown below. The figures are believed to be correct, being, in most cases, the returns approved by the Boards of Supervisors in the various counties.

The tabulation below shows a ratio of 2.25 to 1 against the measure, which was defeated in every county. The YES vote was 239,524, 30.8 per cent of the total, compared with a NO vote of 536,624, or 69.2 per cent. The heaviest vote against the measure was in Alpine and Orange counties, about 7 to 1. Other ratios are, San Francisco, 1.38 to 1; Los Angeles, 2.7 to 1; Alameda, 2.3 to 1; Fresno, 2.45 to 1; Sacramento, 1.1 to 1; and San Joaquin, 2.4 to 1.

	YES	NO
Alameda	25,990	58,254
Alpine	6	42
Amador	455	1,536
Butte	2,414	6,114
Calaveras	681	1,430
Colusa	550	1,478
Contra Costa	4,011	9,693
Del Norte	112	490
Eldorado	857	1,489
Fresno	8,669	21,108
Glenn	973	2,688
Humboldt	1,830	6,712
Imperial	1,701	3,331
Inyo	824	1,429
Kern	4,731	11,217
Kings	700	4,658
Lake	520	977
Lassen	435	1,428
Los Angeles	42,100	113,545
Madera	1,386	2,072
Marin	2,299	5,849
Mariposa	219	657
Mendocino	706	3,964
Merced	1,558	3,875
Modoc	120	1,391
Mono	58	134
Monterey	1,483	4,973
Napa	468	1,477
Nevada	961	2,158
Orange	2,902	14,798
Placer	2,140	2,997
Plumas	417	680
Riverside	2,843	6,948
Sacramento	11,880	13,054
San Benito	686	1,837
San Bernardino	3,985	13,909
San Diego	9,377	18,391
San Francisco	53,110	73,169
San Joaquin	5,390	12,877
San Luis Obispo	1,464	4,647
San Mateo	3,319	7,242
Santa Barbara	1,598	6,959
Santa Clara	7,517	18,270
Santa Cruz	1,850	5,703
Shasta	1,287	3,333
Sierra	135	362
Siskiyou	2,021	2,847
Solano	3,234	6,303
Sonoma	2,685	11,299
Stanislaus	3,987	6,590
Sutter	750	1,867
Tehama	1,357	2,296
Trinity	231	690
Tulare	3,787	12,515
Tuolumne	1,163	1,666
Ventura	1,060	5,901
Yolo	1,546	3,249
Yuba	986	2,060
Totals	239,524	536,624

Final Agreement Drawn Up By Colorado River Commission

After a series of formal sessions at Santa Fe, N. M., which commenced on Nov. 9, the Colorado River Commission, composed of representatives of the various states in the Colorado River basin and headed by Secretary of Commerce Herbert C. Hoover, has evolved a pact governing all phases of the distribution and use of the waters of the river among the several states affected. The pact has yet to be ratified by the state legislatures and Congress before it becomes effective.

The agreement reached at the Santa Fe meeting marks the conclusion of a series of hearings held in several western cities at which data governing every phase of the development of the river was presented by the states themselves and by interested parties. The purpose of the 2,000-word compact as set forth in its initial paragragh is "to provide for the equitable division and apportionment of the use of the waters of the Colorado River system; to establish the relative importance of the beneficial uses of the waters; to promote interstate comity and to remove causes for present and future controversies."

The compact divides the river basin into two divisions, the upper including Colorado, Wyoming, Utah and New Mexico, and the lower, California, Arizona and Nevada. The agreement apportions in perpetuity to each section the exclusive beneficial use of 7,500,000 acre-ft. of water per annum, including the water necessary to supply the existing rights. The lower basin is also given the right to increase this amount 1,000,000 acre-ft. per annum. In case of an international treaty involving Mexico and the United States, any water which might be set aside for the use of the former will be supplied from the surplus over and above the said 15,000,000 acre-ft. included in the compact. Further apportionment of unapportioned water may be made at the end of 40 years.

The use of water for power purposes is made subservient to agricultural uses while the commission does not recognize the navigability of the river. Should Congress not agree to this clause, it may be stricken out without changing other clauses of the compact.

Through commissioners whose acts are subject to legislative approval provision is made for the settlement of future interstate controversies. Provision is also made for the setting up of a commission of state and national water officials for the collection of information and the measurement of the flow of the river.

The agreement was signed by the following officials:

Secretary of Commerce, Herbert C. Hoover, representing the U. S. Government; W. S. Norviel, Arizona; W. F. McClure, California; Delph E. Carpenter, Colorado; J. G. Scrugham, Nevada; Stephen B. Davis, Jr., New Mexico; R. E. Caldwell, Utah, and Frank C. Emerson, Wyoming.

Northwestern visitors and some of the hosts at the opening of the Copco plant of The California Oregon Power Company, Nov. 5. Sitting, from left to right: W. H. Crawford, manager, department of industries, Portland Chamber of Commerce; I. T. Sparks, district freight and passenger agent, Southern Pacific Company; C. P. Osborne, superintendent, light and power, Portland Railway Light & Power Company; J. C. Thompson, assistant treasurer, The California Oregon Power Company; Will Baldwin, Baldwin Hardware Company, Klamath Falls, Ore.; T. G. Bradley, generating superintendent, The California Oregon Power Company. Standing, from left to right, first row: G. E. Quinan, chief electrical engineer, Puget Sound Power & Light Company; J. Pardee, The California Oregon Power Company, Medford, Ore.; J. A. Ormandy, assistant general passenger agent, Southern Pacific Company, Portland, Ore.; F. M. Redman, Western Electric & Manufacturing Company, Portland, Ore.; L. R. Elder, manager, small motors department, General Electric Company, Portland, Ore.; F. V. Sames, representative, Allis-Chalmers Company, Portland, Ore.; O. W. Mielke, president, Portland Chamber of Commerce, Portland, Ore.; W. P. Ellis, secretary, Public Service Commission of Oregon; Ed. Searing, construction engineer, Portland Railway Light & Power Company, Portland, Ore.; E. F. Pearson, engineer, Northwestern Electric Co., Portland, Ore.; H. L. Walther, superintendent, The California Oregon Power Company, Medford, Ore.; H. H. Schoolfield, chief engineer, Pacific Power & Light Company, Portland, Ore.; A. M. Clark, manager, Columbia Steel Company, Portland, Ore. Second Row: Will T. Neill, rate engineer, Pacific Power & Light Company, Portland, Ore.; R. M. Boykin, vice-president and general manager, North Coast Power Company, Portland, Ore.; L. A. McArthur, vice-president and general manager, Pacific Power & Light Company, Portland, Ore.; E. F. Whitney, manager, lumber industries department, General Electric Company, Portland, Ore.; J. D. Beebe, rate engineer, Public Service Commission of Oregon; W. M. Shepard, general agent, The California Oregon Power Company, Medford, Ore.

San Francisco Will Govern All Radio Installations

Complete charge and supervision of all radio receiving and transmitting sets in San Francisco is now in the hands of the department of electricity of the city. This move by the board of supervisors has been made necessary, because of several accidents due to improvised radio set wirings.

According to Ralph W. Wiley, chief of the department, all persons, firms, or corporations, installing or maintaining radio antennae, must file an application for a permit before installation. The new order went into effect Nov. 15 and all persons who had installed radio sets prior to that time are to be given until Dec. 15 to secure a permit.

In the new rules, which provide for a minimum inspection fee of $1, it is stated that antennae must have a vertical clearance of 8 ft. over any roof and construction must be of substantial nature. Attaching wires or supports to fire escapes is forbidden.

Christmas Opening Is Scheduled for New Don Pedro Dam

Work on the Don Pedro dam, the $4,000,000 California project of the Modesto-Turlock Irrigation District, is being rushed along in order that the opening ceremonies may be held by Christmas Day. More than 500 men are now at work and according to D. H. Duncanson, superintendent in charge of construction, the remaining 30,000 cu. yd. of concrete can be poured in time to permit the holding of ceremonies at the proposed time.

It is also expected that, by the time water is needed for the 1923 crop season, the two districts will have the benefit of the 28,000 acre-feet, which the dam will impound. When completed the dam will be 176 ft. long at its base, on the river bed, 285 ft. high, and 1,000 ft. long at the top.

Two transmission line towers have recently been put in place on the Don Pedro end of the line from Don Pedro to Turlock. The first towers at the other end of the line were placed some time ago. This line will carry the power which will be generated at a power house to be erected at the foot of the dam on the Turlock side.

Marconi Company Plans to Erect Station in Vancouver

The Marconi Wireless Telegraph Company of Canada, Ltd., has made application to the Dominion government for a license to erect and operate a continuous-wave wireless telegraph station of sufficient power to communicate directly with Great Britain, Australia, and the Orient. It is estimated that the plant will cost in the vicinity of two million dollars.

The Vancouver station is only one of several plants that the Marconi company proposes to erect in Canada. Other plants will be situated at Winnipeg, Toronto and Montreal, but the Vancouver plant will be by far the largest of the group. The company proposes to spend five million dollars on these plants. If the necessary license is obtained in time, work on the Vancouver plant is to be commenced early in January.

The Safford Light & Power Company of Safford, Ariz., is at present enlarging its power house and will add a complete new unit to the plant. The concrete foundation has already been laid.

The realty board of Porterville, Calif., has prepared a resolution asking the city trustees of Porterville to acquire the distributing system of the Southern California Edison Company in that city.

Vancouver Residents Will Get Lower Electric Rates

Light rates in the city of Vancouver will be reduced on Jan. 1, 1923, from 6 cents to 5 cents per kw-hr. by reason of a franchise agreement passed between the city council of Vancouver and the British Columbia Electric Railway Company.

The agreement modifies the existing franchise as regards street car fares by continuing the 6-cent fare for three years longer and while the company agrees to the lighting rate reduction mentioned as a return for this concession, other clauses are that the company must within five years spend $250,000 on placing light and power wires underground; that it relay three miles of car track with permanent construction at a cost of $105,000, and that it pay $5,000 a year to the city for maintaining the pavements between the car tracks.

A further clause provides for motor bus transportation in the outlying sections, the company paying one-half the anticipated deficit up to the sum of $5,000 and the city paying the remainder of the deficit out of the percentages on gross fares received from the company. In the districts mentioned, the city is interested as a large owner of property which has reverted to it at tax sales.

The agreement covers only the city of Vancouver which has only two-thirds of the population of Greater Vancouver. In the suburban districts higher lighting rates and fares are charged and these will be subject to further agreements.

While the lighting rates are not subject to revision, the street car fares will be at the end of three years and at that time, failing an agreement, the company and the city may resort to arbitration in the usual way.

San Joaquin Light & Power Corporation's building, being erected in Fresno, Calif.

Ten Story Office Building for Fresno Power Company

A building, to be the tallest in the city, is now being erected in Fresno, Calif., by the San Joaquin Light & Power Corporation. The new structure is to be ten stories in height and will cover an area 150 x 75 ft. A basement will be under the entire building.

The new building, which has been the dream of A. G. Wishon, vice-president and managing director of the company, is now being erected at the corner of Tuolumne and J streets. Ground was broken for the structure on Sept. 27. It will be of Class A construction throughout with a tinted brick and terra cotta exterior face. The estimated cost of construction has been placed at $600,000, and the building should be completed by Jan. 1, 1924.

According to projected plans the building, when completed, will be the most brilliantly illuminated in the southwest. Flood lights in colors are to give the brick and terra cotta facing a spectacular brilliancy, making it visible from points several miles from Fresno. A large electric sign to be placed on the roof will be illuminated every evening.

The San Joaquin Light & Power Corporation and its subsidiaries will occupy the entire building, except one floor and thirteen offices on another floor, which will be rented until the growth of the company business requires these offices for its own use. The Valley Electrical Supply Company will occupy the first floor, leaving room for the consumers' counter, where bills of the power company may be paid. The other companies to be housed in the new building are: the Fresno City Water Corporation, the Midland Counties Public Service Corporation and the Bakersfield & Kern Electric Railway.

The tenth floor will be devoted to a large room, where meetings and entertainments may be held, a library, kitchen, committee rooms and an auditorium. It is the purpose of the company to have the floor open to the employees at all times. A promenade ten feet wide will be constructed around this floor from which it will be possible to get a good view of the city and the surrounding country.

At the present time the departments of the Fresno office are scattered in many buildings. Among the departments to be located in the new building are the Executive, Finance, Research, Operating, Power Development, Legal, Supplies, Service and Sales, Personnel, and Medical Divisions.

Commission Orders Company to Reduce Power Rates

The public utilities commission of Idaho has ordered a reduction of 25 per cent on all rates of the Kootenai Power Company of Pocatello, Idaho. The reduction is to be made after all discounts now applicable are taken, but the minimum now in effect shall not be disturbed. The company is ordered to file a new schedule of rates with the commission by Dec. 1.

The commission found that the total value of all property used was $141,000 instead of a reproduction cost as submitted by an engineer, of $167,701. The commission also found that the total annual allowance for maintenance and taxes should be $41,201.33, and that the reasonable depreciation would amount to $3,267.75.

Use Diamond Drill to Determine Character of Base Rock

To ascertain whether the rock on the proposed site will support a dam, diamond drills are being used to secure samples of the base rock at the site of the proposed Pine Flat Water Storage dam, on the Kings River, near Piedra, Calif. A series of twenty-five holes will be drilled, varying in length from 30 to 150 ft.

Dr. James P. Smith, of Leland Stanford Junior University, made a geological survey of the site during the past summer and his report states that the erection of a dam there is entirely feasible. Natural rock walls will aid in forming the storage reservoir.

Permit to Develop Utah River Subject of Application

W. F. Holt, of 2118 South Harvard Boulevard, Los Angeles, has filed application with the state engineer of Utah for the use of 50 sec.-feet of water from the east fork of the Sevier River, to be used in the development of power in connection with a reclamation project of considerable proportions near Widtsoe, in Garfield County.

It is planned to convey the water in a flume for 2,200 ft. and then to conduct it through 600 ft. of 48-in. pipe, leading it over a 6-ft. Pelton wheel under a head of 78 ft. This is calculated to develop 376 hp. for pumping purposes and to supply electrical energy to the communities of Widtsoe and Antimony. A masonry and concrete dam is to be used.

The right of the people to grant franchises in the City of Denver has been held to be theirs and theirs only in a recent decision of the Supreme Court of Colorado. The city council of Denver granted a "revocable charter" to the Denver Tramway Company to reroute its lines in the city and, according to the latest decision from the state courts, the city council has no right to grant any permit or license for such purposes. The court held that it would be necessary to obtain a new franchise from the people by means of the ballot.

Eighty Mile Transmission Line Is Being Constructed

Eighty miles of transmission line are being constructed and two substations are being rebuilt and made larger under the plan of the San Joaquin Light & Power Corporation of Fresno, Calif., to provide additional means of supplying power to the Midland Counties Public Service Corporation at its Santa Maria substation. A private telephone line 65 miles long is also being placed by the power company.

The construction program will call for an expenditure of about $550,000 and construction is due to be completed by Feb. 1, 1923. The new line will connect the Midway steam plant of the San Joaquin Light & Power Corporation with the Santa Maria substation of the Midland company.

The size of the McKittrick substation of the San Joaquin company will be increased in order that greater transformer capacity may be obtained. The present yard structure of wood will be replaced by steel and concrete. New transformers will have a capacity of 15,000 kw. and will "step down" the 110,000-volt current from the Midway plant to 70,000 volts for transmission to Santa Maria, Henrietta and Taft. In addition other transformers will bring the voltage down to 11,000 volts to take care of the oil field load around McKittrick.

The Santa Maria substation of the Midland Counties company is being reconstructed to provide for the entrance of four 70,000-volt lines. The Betteravia steam plant near Santa Maria will also be connected with this substation.

Portland Baking Company Orders Six Electric Trucks

An order for 6 one-ton Ward electric delivery trucks and a very complete General Electric charging equipment was recently placed by the United States Baking Company of Portland, Ore. Each truck will carry an Edison battery of seventy G-9 cells requiring a 4¾-hr. charge at 67½-amp. rate.

The 75-kw. charging set is of sufficient capacity to care for the six batteries simultaneously as well as provide reserve capacity for future increases. The motor generator, which will be placed in the basement, is equipped with automatic starter controlled from the ground floor where the switchboard and trucks will be located. The switchboard consists of a.c. line panel, d.c. generator panel, and six charging sections.

This equipment, when it is installed, will be one of the largest up-to-date electric truck layouts in the city of Portland.

Connecting Line to Be Built by Idaho Railroad Company

To give the Twin Falls district a direct outlet to Pacific Coast ports and to supply railroad connections for the new copper mining district of Contact, Nev., the Idaho Central Railroad Company will complete within a year's time a 90-mile railroad from Twin Falls, Idaho, to Wells, Nev., according to E. W. Mason, general manager of the Western Pacific Company. The Idaho company is being backed by the Western Pacific Company.

At Wells the new line will connect with the main lines of the Southern Pacific and the Western Pacific. This connection will afford much better transportation facilities to the southern Idaho territory, as in the past freight had to be routed east to Salt Lake City, Utah, and then west again to Pacific Coast ports.

New Flood Protection Plan for Pueblo Is Presented

A plan to put the Arkansas River back in the channel which it occupied years ago, has been proposed by Arthur E. Morgan, the engineer who is endeavoring to provide flood protection to Pueblo, Colo. The original plan to put the river along the bluffs opposite the Union station was opposed by the railroads entering the city. The present plan seems more feasible.

Mr. Morgan's plan is to provide a channel 12,600 ft. long, 200 ft. wide, 27 or 28 ft. deep, and one which would allow the flow of 125,000 sec.-feet of water. This amount of water is nearly double the quantity that caused the damage to Pueblo in 1921. A 15-ft. retaining wall would separate the river from the station and freight yards.

Should the new plan be adopted it would permit the removal of eight bridges now in use in the city. The present station and ten tracks south of it would not be disturbed and united freight yards would be provided. The project would take about four years to complete and would cost in the neighborhood of $4,000,000.

Power Permits Requested from Federal Commission

The application filed by the City of Los Angeles, for license for a proposed power house to be built on its aqueduct from Owens River to Los Angeles, is the largest western application received by the Federal Power Commission in the three-weeks period ending Nov. 4 The Los Angeles application states that the city plans to erect a power house to have an approximate capacity of 64,000 hp. at a point known as Haiwee Narrows, about two miles below the Haiwee Reservoir, in Inyo County, Calif.

An application for a preliminary permit for a combined power and irrigation project, including a dam and reservoir, on the headwaters of the North Fork of the Cosumnes River, near Placerville, Calif., has been filed by M. C. Seagrave. A canal 5 miles long will be constructed to a power house with an installed capacity of approximately 13,000 hp. A portion of the power will be used for pumping for irrigation purposes and the remainder will be sold to public utility companies.

Another application received by the Federal Power Commission, was that of the Home Power Company, of Alaska. This application is for a preliminary permit for a proposed project with capacity slightly in excess of 100 hp. The proposed installation will supplement the existing power supply of the company, especially during the winter months when the water flow is low. The project is to be located on the North Fork of the Skagway River, about 5 miles from the town of Skagway.

Colorado Business Flourishing, State League Report

That business in general is flourishing in Colorado is reflected in a report recently compiled by the Electrical Co-operative League of Denver. Although normal conditions have not returned to every line, including the electrical contractor's business, indications, according to the report, point to a rapid recovery and one that holds out unusual promise for the new year.

Government statistics on Colorado industries, labor, and transportation along with municipal and state reports as collected and digested by the League, corroborate statements made by prominent bankers and business men that Denver especially has in many respects returned to the boom days of 1920, but in a more solid and permanent manner. The bank clearings for the months of October alone exceeded the high month in 1921 by nearly twenty-five million dollars, the total clearings reported having been $158,112,921.

The federal department of labor report is quoted to the effect that the employment situation is steadily improving and that ample openings are to be found in Denver and vicinity for all available workers. Especially in the building trades, because of the unabated continuance of new construction, a moderate shortage of craftsmen has resulted.

The city building department of Denver reported the issuance of building permits during October in the amount of $1,211,300 and one of the federal government reports was authority for anticipating the starting of nearly two million dollars of new construction work in the 30 days following.

The figures compiled by Postmaster Frank L. Dodge of Denver likewise show a marked increase, according to the report, having totaled nearly a quarter of a million dollars in receipts during October, an increase of 11.2 per cent over the same month in 1921.

Denver holds a preponderating lead in the matter of savings deposits, exceeding all other cities in the tenth federal reserve district, with a total of $47,275,514 by 81,031 persons.

One disappointing feature of the November election is the rejection, by the voters of the state, of the proposed constitutional amendment providing for the supervision, by the public utilities commission, of all public service companies except those municipally owned. Although given splendid support in most sections of the state, its failure was mainly attributed to campaigns by certain newspapers. Between five and six million dollars would have been released immediately for much needed extensions and other improvements by telephone and central station companies, it is understood, had the amendment carried.

All electrical jobbing houses in Denver are reported as being optimistic in view of anticipated as well as present business. Additions are being made to their sales forces and warehousing facilities are being increased to protect against threatened shortages in the supply of wiring devices and materials. Their appliance sales are picking up and a healthy holiday business is indicated.

Available Water Supply Topic of Report to Commission

A statement of facts and recommendations, concerning the available water supply of the state of Idaho, has been prepared by W. G. Swendsen, Idaho state commissioner of reclamation, and has been sent to the Federal Power Commission at Washington. The purpose of the report is to give the commission accurate information on the demands of the state for irrigation purposes and on the power developments that are possible on the Snake River and its tributaries.

The report was prepared as an answer to the application of the Pacific Power & Light Company, of Portland, Ore., for power permits on the Snake River between Weiser, Idaho, and the point where the river crosses the Washington state line. A map which accompanied Mr. Swendsen's report shows that nine-tenths of the state is affected by the application of the power company to erect power plants along the river. According to Mr. Swendsen, 85 per cent of the water available for power at the sites mentioned by the power company in its application, originates within the boundaries of Idaho.

Agriculture is the leading industry throughout the southern part of the state and should be given preference in the use of water there, according to the report. In addition it is stated that on account of the origin of the water of the Snake River, any development should be on the Idaho side of the river and the power resources should be considered as those of Idaho.

Building Activity Demands Much Electric Equipment

Los Angeles is absorbing a greater volume of electrical supplies, material and equipment than any other city in the United States as a result of its unprecedented building activity, according to a survey which has been made by the California Electrical Cooperative Campaign in cooperation with various electrical manufacturers. New homes are absorbing an average of $750,000 worth of wiring supplies and equipment monthly.

This sum was arrived at by the application of average figures which were recently compiled on the electrical equipment of new homes which were being erected in southern California. It is estimated that the fixtures in the average home cost approximately $75 while other equipment costs $125. Building records show that there are an average of 3,000 new homes being erected monthly in the city of Los Angeles alone. This does not include the homes in the surrounding territory nor does it include flats, apartment houses or double bungalows. Industrial and office buildings are not taken into consideration.

Figures for the last four years reflect the remarkable increase in building activity in Los Angeles. In 1919, 13,344 permits with a valuation of $28,253,619, were issued. In 1920, the total jumped to 25,555 permits and a valuation of $60,023,600. Last year, the former record-holder, closed with a total of 37,206 permits, and a valuation of $82,761,386. It is estimated that the number of permits this year will closely approximate 50,000, and that the valuation will be in the neighborhood of $110,000,000.

The great increase in building activity is illustrated in the growth, from month to month, in number and value of building permits from January of last year to the present month. The figures are as follows:

	1921	1922
January	$3,301,714	$ 7,975,168
February	3,131,670	7,579,798
March	6,915,216	10,964,829
April	7,250,571	12,959,686
May	7,433,760	9,327,504
June	6,269,546	10,652,265
July	5,503,369	8,064,018
August	7,015,861	11,523,891
September	8,303,665	10,267,894
October	9,781,394	*10,164,959
November	8,685,775	.....
December	7,975,168	.....

*—To October 26.

Records show that the number of homes constructed during the first ten months of the year is approximately 31,000. In these homes lighting fixtures valued at $2,325,000 have been installed while wiring supplies and other materials to the value of $3,875,000 were used. It is estimated that almost the same sum has been spent for apartment houses, flats and double bungalows.

Sales of household appliances are also being reflected in the number of new homes which are being erected. Practically all of the homes are being constructed with adequate laundry space and the number of convenience outlets being installed is mounting monthly. Sales of electric ranges are gradually increasing and are expected to be stimulated by campaigns which the manufacturers are planning or have instituted.

Construction of Mills and Town Started by Lumbermen

The successful floating of a bond issue of $9,000,000 has been announced by R. A. Bell, chairman of the Long-Bell Lumber Company of Kansas City. The company has purchased some 6,000 acres of land from the Weyerhauser Timber Company standing near Kelso, Wash., and will erect large mills at this point. It has been announced that the mills will have a capacity of 600,000,000 ft. annually and will be electrically driven throughout. The plans call for a turbo-generating unit of 25,000-kw. capacity. Erection of the plant involves much dredging and dyking and construction of a bridge over the Cowlitz River.

The great project of the lumber company is well under way. A new townsite as well as a new mill has been planned by an expert, and a large force of men is engaged laying the foundations for the two enormous sawmills; a 6-story hotel to cost $350,000; erecting scores of homes and business houses; street grading and sewer digging. The Port of Portland dredges are throwing up a 33-ft. dike and have already completed several thousand feet. The dike will be 15 miles in length when completed.

The California Oregon Power Company, with head offices in Medford, Ore., has filed an application with the state engineer for diverting water from the North Umpqua River for power purposes. Three separate divisions are included in the application.

Books and Bulletins

Steam-Engine Principles and Practice

Edited by TERRELL CROFT, consulting engineer; assisted by the following staff of contributors: EDMUND SIROKY, H. C. CROFT, A. J. DIXON, and E. R. POWELL. 513 pages, 5½ by 9 in., 547 illustrations. $3.50. McGraw-Hill Book Company, Inc., New York.

There has been a long-felt need for a practical book which would contain information that an operating engineer or plant superintendent requires concerning steam engines. This book contains data that will enable the reader to select, operate, care for and repair steam engines properly and to make a study of how to improve their economy. The general order of treatment of the subject is excellent. The text starts with the functions and principles of the steam engine, followed by a division on nomenclature and classification. The uses of indicators, the valves and governors, condensers, multi-expansion enginee, and engine efficiencies are treated in order. Testing, management and operation, repair and selection of engines are also considered in detail. The book closes with a thorough treatment of lubrication. Throughout the text principles which are presented are explained with descriptive expositions or with worked-out arithmetical examples. Problems and questions are included for helping the reader. The volume may aptly be called a practical book for a practical man.

Electric Transients

By C. E. MAGNUSSON, Professor of Electrical Engineering, and Director of the Engineering Experiment Station, University of Washington; A. KALIN, Instructor in Electrical Engineering, University of Washington, and J. R. TOLMIE, Instructor in Electrical Engineering, University of Washington. 6 by 9 in., 196 pages, 161 illustrations. $2.50. McGraw-Hill Book Company, Inc., New York.

Outlining the introductory lecture and laboratory course given for more than twelve years at the University of Washington, the book aids the student in gaining clear concepts of the fundamental principles of electric transient phenomena and their application to quantitative problems. The course is elementary with emphasis placed on the physical properties of electric transients. The text is illustrated and supplemented by a large number of oscillograms of transients that occur in the various types of machines and electric circuits in common use in electrical engineering laboratories. The problems are based on quantitative data obtained from laboratory experiments under circuit conditions that may easily be reproduced by the student. Transient electric phenomena are commercially important in the operation of large and complex electric systems, and a knowledge of the fundamental principles of electric transients and their application to the solution of quantitative problems are highly essential to the successful operation of large power and communication systems.

Meetings

Electrical Association Executive Committee to Meet

A meeting of the executive committee of the Pacific Coast Electrical Association has been called for Dec. 15 at Hotel Del Monte. At this time President James B. Black will outline his ideas for the coming season, and details of the convention next June will be discussed. The members of the executive committee are James B. Black, L. M. Klauber, William Baurhyte, J. B. Anthony, Samuel H. Taylor, A. B. West, G. E. Arbogast, R. A. Balzari, S. Waldo Coleman, E. B. Criddle, H. L. Harper, A. N. Kemp, F. A. Leach, Jr., R. S. Masson, H. R. Noack, Robert Sibley and A. Emory Wishon.

Lumbermen's President Addresses Joint Electric Meeting

At the regular monthly joint meeting of the Portland sections of the A.I.E.E. and the N.E.L.A. held at the University Club on Nov. 14, Norman F. Coleman was the principal speaker. Mr. Coleman is the president of the Loyal Legion of Loggers and Lumbermen and gave a most instructive talk on the subject, "Giving Labor the Place to which It Is Entitled."

Mr. Coleman was well qualified to speak on this subject as he has been directly responsible for a large share of the success met in solving labor problems in the Northwest lumber district. The organization known as the "4-L's" started during the war when a group of loyal American citizens engaged in lumbering determined that labor disputes causing lumber shortage must stop. The idea has grown until it now covers the entire Northwest. Agreements are made between the owners and workers, whereby the workers have a part in deciding those things which vitally affect them. Most gratifying results have been obtained.

Dr. Benjamin S. Haywood, pastor of the Wilshire Methodist Church, was the speaker at a recent meeting of the Electric Club of Los Angeles. Dr. Haywood has recently returned to Los Angeles from a four months tour of Europe and the Holy Land. His talk dealt with the relation of the electrical industry to the rest of the world. Two musical numbers were included in the program presented the members of the club.

W. S. Murray, consulting engineer of New York, addressed the Spokane section of the American Institute of Electrical Engineers and the Associated Engineers of Spokane at a joint meeting held at the Davenport Hotel in Spokane, Wash., recently. Mr. Murray is director of the Super-power Survey and stopped over in Spokane on his way to the East. The meeting was well attended by the engineering fraternity of Spokane and Mr. Murray's audience was greatly interested in the talk which was presented by the eastern engineer.

Denver Radio Dealers Meet at Instruction Conference

Nearly fifty radio jobbers in the Rocky Mountain states attended the three-day instruction conference held under the auspices of the Denver Radio Service Bureau at Denver, Colo., Nov. 16-18. The conference was held at the Colorado National Guard broadcasting headquarters.

The discussion during the meeting covered topics of mutual benefit to retailers and jobbers. The purpose of the conference was to give the dealers a better knowledge of radio merchandising and also of the working of the equipment. Plans for cooperative advertising campaigns were also discussed.

The Denver jobbing firms which have joined to make the Denver Radio Service Bureau are: the Hendrie & Bolthoff Manufacturing Company, the Reynolds Radio Company, the Mine & Smelter Supply Company, the Rocky Mountain Radio Corporation, and the Winner Radio Corporation.

Radio Bureau Is Organized by Los Angeles Jobbers

As an outgrowth and development of the Los Angeles Broadcasting Association, the Los Angeles Radio Bureau has been formed by the radio jobbers of the southern California city. The bureau has for its main objects the advancement of the interests of radio, the fixing of standards, the convincing of the public that radio is a utility and not a toy, the improvement of broadcasting as a means of education and entertainment, and the more general application of radio apparatus to the daily affairs of life.

The broadcasting association planned to erect a 1,000-watt broadcasting station, but the new bureau feels that there are sufficient stations at present both erected and under construction in the southern part of California and will not erect such a plant at this time. The radio bureau will, however, keep daily distaphone records of what is being broadcasted and will endeavor in this way to offer suggestions and advice concerning the programs sent out by the broadcasting stations. A publicity campaign will also be instituted by the bureau to increase the sale of equipment.

I. S. Lesser, of the Radio Supply Company of California, is the president of the new organization. The other officers are: G. E. Arbogast, vice-president; R. E. Sadler, secretary-treasurer; T. J. Johnson, staff engineer.

COMING EVENTS

Pacific Division, National Electrical Supply Jobbers' Association—
Quarterly Meeting—Hotel Coronado
Dec. 7-9, 1922

American Society of Mechanical Engineers—
Annual Meeting—New York, N. Y.
Dec. 4-8, 1922

National Council of Lighting Fixture Manufacturers—
Annual Convention—Cleveland, Ohio
Jan. 15-20, 1923

Lighting Fixture Dealers Society of America—
Annual Convention—Cleveland, Ohio
Jan. 15-20, 1923

American Institute of Electrical Engineers—
Midwinter Convention—New York, N. Y.
Feb. 14-16, 1923

New Officers Are Selected by Rocky Mountain League

Along with the intensive development of its revised program of increasing the electrical market in the Rocky Mountain region, the Electrical Cooperative League in Denver, Colo., has elected a new group of officers for its second fiscal year. The election was held Nov. 8 after the various groups had chosen their representatives to serve on the league advisory board.

John J. Cooper, the retiring secretary and treasurer, and one of the leading spirits in the movement since the league was organized early in 1921, was elected chairman unanimously. He is the head of the Mountain Electric Company, a prominent jobbing organization, and is also interested in several Colorado central station properties. Although primarily a jobber, he is a member of the Rocky Mountain Committee on Public Utility Information.

Charles N. Shannon, a pioneer electragist, and for many years a leader of the Denver Association of Electrical Contractors and Dealers, was elected vice-chairman. R. W. Elliott, sales manager of the Albert Sechrist Manufacturing Company, was chosen as seretary, while O. L. Mackell, office manager of the Denver Gas & Electric Light Company, was designated as treasurer.

Those chosen to serve on the advisory board are: manufacturers—G. O. Hodgson, J. P. Sprunt, Jr., Alex. Hibbard and R. W. Elliott; jobbers—B. C. Watts, N. E. Lawrence, J. W. Ryall and J. C. Davidson; contractor-dealers—E. A. Scott, J. Fischer, E. C. Headrick and C. N. Shannon; central station men—R. G. Gentry, F. F. McCammon, Clarence Keeler and O. L. Mackell.

"Get-together" Meeting Is Held by Salt Lake City Men

The first of a series of "get-together" meetings of men of the electrical industry of Salt Lake City was held Nov. 9 under the auspices of the Rocky Mountain Electrical Cooperative League, at the Salt Lake Commercial Club.

A feature of the meeting was an address by E. H. Eardley, Salt Lake City executive member of the National Association of Electragists, on the recent national convention held at Cincinnati. Professor Earl J. Glade, of the University of Utah, also gave a very interesting address on the subject of "Business Economy."

P. L. Goddard, secretary of the Rocky Mountain Electrical Cooperative League, also entertained with a monologue.

An election to determine whether the city council of Tucson, Ariz., will be empowered to grant a franchise to operate a street railway on certain streets of the city, to the Tucson Rapid Transit Company will be held in Tucson on Dec. 11. The franchise which is sought contains stipulations as to the way in which the petitioning company is to maintain service and equipment.

The city trustees of Exeter, Calif., are contemplating installing twenty-eight more electroliers within the city limits.

Personals

Frederick G. Cottrell, of Washington, D. C., known to Californians as the inventor of the Cottrell Process of electrical precipitation, has recently taken over the directorship of the nitrogen research laboratory of the Department of Agriculture formerly under the direction of **R. C. Tolman,** who has gone to the California Institute of Technology as professor of physical chemistry and mathematical physics.

H. L. Doolittle, assistant construction engineer of the San Joaquin Light & Power Corporation, is in New York attending the meetings of the technical sections of the National Electric Light Association.

John J. Cooper, vice-president and treasurer of the Mountain Electric Company with headquarters in Denver, who recently was elected chairman, by unanimous choice, of the Denver Electrical Cooperative League and also the chairman of the local jobbers' association, is one of the pioneers in the electrical industry of the West. Twenty-nine years ago, Mr. Cooper ventured to Colorado from his native state—Indiana—and obtained a "job" as a messenger and bill collector for $5 a week. He is now considered one of the leaders in western electrical activities, is the head of numerous Colorado public utilities and one of the most enthusiastic supporters of the Electrical League which he helped to organize more than a year ago. Mr. Cooper was born and raised on a farm and obtained but a meager education. From messenger he became a stenographer and subsequently became identified with the electrical business. He is an active member of the Rocky Mountain Committee on Public Utility Information and is vice-president and treasurer of the Arkansas Valley Electric Company, the Gilpin County Light, Heat & Power Company and the Hinsdale Mining & Development Company. He is a member of the Denver Civic and Commercial Association and the Denver Athletic Club.

JOHN J. COOPER

J. O. Case, sales manager, General Electric Company, Los Angeles district, recently visited San Francisco on business for his company.

H. H. Hughes, Westinghouse Electric & Manufacturing Company's representative of Fresno, Calif., recently visited Los Angeles for a few days.

W. C. Sears, western representative, Landers, Frary & Clark, has just recently visited Los Angeles in the interest of his firm and reports excellent business in this section.

George D. Martin, comptroller of William Cramp & Sons Ship & Engine Building Company, spent a week recently at the plant of the Pelton Water Wheel Company in San Francisco. This was Mr. Martin's first trip to San Francisco since the acquisition last winter of control of the local company by the Cramp organization.

H. H. Fogwell, power salesman, Westinghouse Electric & Manufacturing Company, Los Angeles office, has just returned from a four weeks' trip to Chicago, New York, Philadelphia, and East Pittsburgh, visiting the various plants of his firm.

E. E. Nash, treasurer of the Peerless Lamp Division of the General Electric Company, has just recently arrived in Los Angeles to spend the winter. Mr. Nash is one of the pioneer lamp salesmen for the country and now divides his time between Warren, Ohio, and Los Angeles.

P. A. Powers, advertising manager, Benjamin Electric & Manufacturing Company of Chicago, has just left Los Angeles after a visit to the Pacific Coast where he attended a sales conference of his company's Pacific Coast organization.

Walter H. Seaver, manager of sales of the wire products department of the U. S. Steel Products Company of San Francisco, recently spent a week and a half in Los Angeles and Southern California, going over the territory with the representatives in that section.

Dr. Thomas Addison, Pacific Coast manager of the General Electric Company, San Francisco, recently visited Los Angeles and other points in southern California.

W. G. Johnson, manager of the Jefferson Transformer Company of Chicago, has just recently returned to that city after having visited Los Angeles and other Pacific Coast cities in the interests of his company.

Clare N. Stannard, vice-president and general manager of the Denver Gas & Electric Light Company, and **V. L. Board,** his assistant, have attended a meeting of officials of the Henry L. Doherty Company in New York City.

L. C. LaMont, formerly branch manager of the Butte office, Westinghouse Electric & Manufacturing Company, and more recently connected with the El Paso office of that company, has just been transferred to the Los Angeles office.

Major George Mayo, U. S. A., inspector of hydroelectric projects for the War Department, recently completed a survey of some of the hydroelectric plants in district number one, which comprises the Columbia and Snake river watersheds. His survey took him over the property of the Idaho Power Company and the Minidoka Irrigation project.

F. H. Woodward, formerly district manager of the Great Western Power Company at Oakland, has been appointed general sales manager of the company with headquarters in San Francisco, to succeed **James B. Black,** who has been made general manager. Harry Woodward is known to old-time electrical men in San Francisco as having served with the Edison Light & Power Company in the years 1894 to 1898 as salesman. When that company consolidated with the San Francisco Gas Company and became known as the San Francisco Gas & Electric Company, he served until 1902 as superintendent of the contract department. Following this Mr. Woodward with four others left the service of this company and became factors in the newly organized United Gas & Electric Company of San Jose, having Santa Clara and San Mateo counties as their field, and assuming the management of the Standard Electric Company of California, with offices in San Jose, as well. In 1906, following the consolidation of the United Gas & Electric Company with other properties in the bay region, he became associated with R. J. Davis and entered the jobbing business in San Francisco. In 1909 he took charge of the commercial department of the Great Western Power Company in San Francisco and in 1911 when this company took over the City Electric Company of San Francisco he was made manager of industrial sales. When the Great Western Power Company entered the Oakland field, Mr. Woodward succeeded to the management of the Alameda and Contra Costa County districts.

F. H. WOODWARD

R. P. Schwerin, president of the Federal Telegraph Company, **R. R. Beal,** chief engineer of the same company, and three assistant engineers recently sailed from San Francisco for Shanghai to commence construction on three powerful radio stations which will connect the Orient with the Pacific Coast. Those accompanying Mr. Schwerin and Mr. Beal were **H. F. Elliott, J. H. Wallace** and **D. G. Marsh.** The station which will be erected in Shanghai will give transpacific communication its first uncensored service. Mr. Schwerin will remain in the Orient about three months while the remainder of the party will not return until May, 1924.

J. E. Crilley, Pacific Coast representative of the Habirshaw Electric Cable Company, recently visited Los Angeles in the interests of his firm.

H. K. Winterer, industrial control specialist, Los Angeles office of the General Electric Company, has just recently returned from a two months' visit in the East, visiting the factories of the General Electric Company at Schenectady, Bridgeport and Fort Wayne.

H. D. Randall, of the General Electric Company and a prominent worker in the Denver Electrical Cooperative League, spent most of last month in the East on company business.

Harry Ashcraft, a contractor, has been re-elected president of the contractor-dealers' association at Pueblo, Colo., and **E. F. Stone**, superintendent of the Southern Colorado Power Company, has been elected secretary and treasurer.

J. W. Johnston, treasurer of the Western Electric Company, Inc., is a western visitor. After a trip along the coast, he will return East, stopping at Salt Lake City and Denver.

Robert Kyle, of the Kyle Electric Company, and **William Quandt**, one of the superintendents of the Southern Colorado Power Company, recently addressed a meeting of the electrical interests in Pueblo, Colo.

John A. Britton, first vice-president and general manager of the Pacific Gas & Electric Company, has been elected president of the San Francisco Bohemian Club. Mr. Britton's election to this position further exemplifies the esteem in which he is held by his associates and friends. He is fully as active in the life of the community as he is in the electrical industry. As a citizen of San Francisco, he has served as chairman of the local chapter of the Red Cross, as Regent of the University of California, as a director of the Panama-Pacific International Exposition and as

JOHN A. BRITTON

one of the most active promoters of San Francisco's musical enterprises. His work as a public utility executive is too well known for comment. He has been active in every movement which calls for the betterment of the industry. At the present time Mr. Britton is in New York attending the sessions of the Public Relations Committee of the National Electric Light Association.

C. G. Brown, professor of electrical engineering in the collegiate department of the School of Engineering at Milwaukee, has accepted a position with the General Electric Company in the general engineering laboratories. His work will be in connection with instruments, meters and measurements. Mr. Brown is a member of the American Institute of Electrical Engineers, Society for Promotion of Electrical engineering, and the American Association of Engineers.

Robert Treat, member of the lighting engineering department of the General Electric Company, Schenectady, gave a paper on "Relays as Applied to Power Systems" before a meeting of the San Francisco Section of the American Society of Electrical Engineers recently.

A. W. Cobley, general engineer for the Westinghouse Electric & Manufacturing Company with headquarters at San Francisco, is now in East Pittsburgh on a business trip.

C. E. Blee, formerly assistant general agent for The California Oregon Power Company, Medford, Ore., has been transferred to the engineering department and given enlarged duties with the title of assistant engineer.

E. B. Powell, of Stone & Webster, Inc., of Boston, sailed recently on the Majestic to make a study of developments in European power plant practice. He expects to visit England, France and Germany.

P. W. McCauley of the Russell Electric Company, Denver, is a recent San Francisco visitor.

A. V. Thompson, assistant sales manager, General Electric Company, San Francisco, has been in Los Angeles recently, on his return from a trip East where he attended the convention of the American Electric Railway Association in Chicago.

Robert Sibley, Pacific Coast editorial director of the McGraw-Hill electrical papers, is in New York attending the annual meeting of the American Society of Mechanical Engineers, which convenes Dec. 4-7, and the council meeting of the American Society of Electrical Engineers which convenes Dec. 8.

F. G. Baum, consulting engineer with offices in San Francisco, is in the East making a study of the high tension insulator problem.

Frank E. Boyer, who has been residing in Los Angeles for the past year and a half and who was formerly manager of the General Electric Company's offices in St. Louis and Chicago, has just recently left for Honolulu on a six months' visit.

H. B. Vanzwoll, manager of Sunbeam Division of National Lamp Works of Chicago, recently spent a week in Los Angeles and southern California in the interests of Sunbeam Mazda Lamps.

O. B. Coldwell, vice-president of the Portland Railway Light & Power Company, has been East in connection with the selection of equipment for the company's new Oak Grove hydroelectric project.

C. C. Hillis, vice-president and general manager of the Electric Appliance Company of San Francisco, is in eastern business centers and while East is attending the convention of the National Electric Supply Jobbers' Association which meets at Cleveland.

T. J. Pace, manager supply sales department, Westinghouse Electric & Manufacturing Company, has been in San Francisco for a week's visit after spending several days at Los Angeles. His trip to the coast was timed to coincide with that of **H. D. Shute** and **H. P. Davis**, vice-presidents of the same company, who have been here for the purpose of holding a Pacific Coast con-

T. J. PACE

ference with district managers. In Los Angeles the company's new plant was inspected and at the conference at Del Monte plans were laid for the new building to be erected at Emeryville across the bay from San Francisco. Both **C. E. Heise**, San Francisco manager, and **K. E. Van Kuran**, Los Angeles manager, took part in the conference. Mr. Pace addressed both the Los Angeles and San Francisco Development Leagues while here.

Otto Knopp, superintendent of the laboratory of the Pacific Gas & Electric Company, recently returned from the East where he has been making a study of the meter problem.

H. W. Janzen has resigned from the electrification department of the Chicago, Milwaukee & St. Paul Railroad, to accept a position as sales engineer in the Seattle offices of the Pacific States Electric Company.

R. W. Elliott, newly elected secretary of the Electrical Cooperative League in Denver, has been appointed sales manager of the Albert Sechrist Manufacturing Company of that city.

Thomas F. Smith, a prominent motor man in Denver, has joined the Electrical Cooperative League in that city.

Obituary

R. L. Clarke, assistant manager of the San Diego Consolidated Gas & Electric Company, died Nov. 8 after an illness of two months. Mr. Clarke has been identified with the public utilities of San Diego for the past thirty-five years and has been with the San Diego Consolidated company since its purchase by H. M. Byllesby & Company in 1905.

Manufacturer, Dealer and Jobber Activities

Harvey Hubbell, Inc., of Bridgeport, Conn., has placed on the market a device which permits the user to operate more than one appliance at a table, using only one convenience outlet. The new table outlet is known as the Triplex Table-Tap. Three beveled T-slot outlets are arranged in multiple. The device may be fastened to the under side of a table top or onto a wall by means of screws.

Henry Hyman & Company, Inc., of New York City, has recently started the publication to be distributed to the members of the electrical fraternity each month. The new booklet is entitled The Hylite Distributor. Dealers desiring to receive the publication regularly can secure it by writing the publishers.

Charles D. Born, of Prescott, Ariz., has recently purchased the electrical store formerly owned by Gordon Furlong. Mr. Born will engage in the electrical contracting business.

The Johns-Pratt Company of Hartford, Conn., has recently appointed George Saylor western sales manager of the company. Mr. Saylor's headquarters will be in Chicago.

Listenwalter & Gough Company, of Los Angeles, has entered upon an extensive advertising campaign for the coming year. The company is distributing agent in southern California and Arizona for the Royal electric cleaner. Plans call for 144 advertisements in all, two to appear each week.

The General Electric Company has recently issued an informative bulletin which is entitled "Switchboard Panels and Supporting Framework." The numbe assigned to the bulletin is 47002 and groups switchboard panels under two general classifications, the vertical type and the bench type. Slate and marble are the two materials mentioned as being universally used for switchboard panels. The standard heights vary from 16-in. single section panels and mounted on supports 48-in. to 99-in. high; panels in three sections on supports 99 in. high. All panels have ⅜-in. bevel. To obtain sufficient mechanical strength, it is suggested, panels should be at least 1½ in. thick with the exception that isolated panels not over 24 by 16 in. mounted on wall brackets and containing light equipment may be made of 1¼-in. slate. The standard supporting framework for panels adopted b ythe Company, consists of 1¾-in. wrought iron pipe for the uprights and ¾ or 1¼-in. pipe for tie rods bracing the panel to the floor. For very small isolated panels containing light weight equipment, wall brackets in place of pipe supports are sometimes used to advantage. The grille work supplied for panels is of the "basket weave," square mesh, welded to an angle iron frame. A hinged grille door with lock and key is provided at one or both ends of the board. The bulletin contains useful information for prospective buyers of switchboards.

The Holophane Glass Company, New York, has placed on the market a new lighting unit designed for use in schools, offices and stores. This new unit is of the enclosing type and lamps from the top instead of the bottom. The upper portion has accurately formed reflecting prisms designed to redirect the light downward. The lower portion has combined horizontal refracting prisms and vertical diffusing flutes. The function of these combination refracting prisms and diffusing flutes is to give the proper distribution of light and to diffuse the light so that the unit has uniform low brightness. An important feature of the unit is that it can not be overlamped, as the opening in the top will pass only lamps of the proper size. There are two sizes of this unit, No. 2170 for the 100-150 watt lamps and No. 2180 for the 200-watt lamps.

Electric Supply and Construction Company, Denver ,Colo., in the development of its fixture manufacturing business, has added Les Chapman to its force of outside representatives.

The Radio Shop, of Sunnyvale, Calif., has recently established a branch factory at St. Louis, Mo. The company is engaged in the manufacture of Armstrong regenerative circuit radio equipment and the increase in demand for its products has necessitated the opening of the new branch. A. B. Dorman, eastern manager for the company, has established his office in St. Louis and has announced that the Echo Radio Corporation has been organized to take over the national distribution of the products of the California company.

The National X-Ray Reflector Company, of Chicago, has recently published three new leaflets describing its line of adapters, luminaries and reflectors. These leaflets are Nos. 377, 378 and 379. A description of each device and views of actual applications are presented in the leaflets.

George Richards & Company, Chicago, has recently placed on the market the Hemco Electric Health Pad, a new convenience device for the sick room which has several attractive features. The new pad is packed in a well designed carton which is suitable for display purposes and is provided with a three-heat control and a small thermostat which regulates the heat when the pad is turned on full-heat.

The Cutler-Hammer Manufacturing Company, of Milwaukee, has recently added, to its line of push-button specialties, the C-H 70-51 switch connector. The device combines in one thermoplax housing universal clips for engagement with contact terminals of practically all irons and table appliances and the quick make-and-break switch mechanism of 660 watts similar to that used in the C-H 70-50 feed through switch. The casing is made in two halves, removal of one exposing the two terminal screws at the top of which the ends of the conductor are attached. A spring coil prevents kinking of cord and prevents wear. The design is such that complete engagement of the contact clip with the posts of the appliance is possible with no interference with the usual post guard.

The Edison Electric Appliance Company, Inc., of Chicago, has recently placed on the market the new Hotpoint Revere percolator urn. A special feature of this urn is the switch handle on the outside of the base of the appliance. The body of the urn is of copper heavily nickel plated.

The Minneapolis Heat Regulator Company, of Minneapolis, Minn., has recently placed on the market a new thermostatic relay switch designed for the thermostatic control of motors, electric heating units, and other electrical circuits. A new bulletin published by the company fully describes the switch and method of installation.

Perhaps because he is the largest (in two ways) manufacturer of electric signs in Los Angeles and maybe because he was chairman of the reception committee, Paul D. House, president of the Electric Products Company, was one of the most conspicuous men at the annual picnic of the Los Angeles contractor-dealers. The smiling young lady to the left of Paul, who is signaling the orchestra to start another dance, is Miss Isabelle Thompson, of the Los Angeles office of the Pacific States Electric Company. Rumor has it that Miss Thompson danced with every man at the picnic. Why weren't we there?

Trade Outlook

San Francisco

The expected seasonal decline in building has hit San Francisco and the San Francisco Bay region with less strength than in previous years and many construction projects are still under way, while others are just starting. Construction costs are rather high thus preventing any decline in rents.

Jobbing houses dealing in winter clothing, blankets, rubber goods, hardware and related articles report that demands are large and that business is good. This demand is attributed to previous tendencies to buy conservatively in these lines. Stocks of staple merchandise are rapidly decreasing and with prices rising, merchants supplied with large stocks are in a good position.

Grape growers in the state suffered the heaviest losses during the recent crop season, due to delays in shipping, because of refrigerator car shortage and a comparatively slow eastern market. Early November rains hindered the harvesting of the rice crop to some extent.

Bank clearings for San Francisco for the week ending Nov. 16, were $160,400,000, an increase of $20,700,000 over the total for the preceeding week. Both weeks show an appreciable gain over the clearings in 1921, but are slightly under the same weeks in 1920.

Electrically equipped residences and apartment houses are becoming more prominent in the city and the San Francisco Bay region. A great number of the builders are eliminating furnaces and are installing electric heating units in the apartments, leaving the tenant to pay the heating charges.

Indications are that the Christmas trade will be brisk and that business will be conducted upon a more profitable basis than it was last year. Dealers in electrical appliances are endeavoring to increase their sales through newspaper advertising campaigns.

Los Angeles

For the first fifteen days of November, Los Angeles building permits kept close pace with the record for October in the numer issued, but fell short in the valuation; however, the 2476 permits issued with a valuation of $5,294,005.00 exceeded the same period of last year by approximately 23 per cent.

Bank clearings for the first fifteen days of November amounted to $228,877,272.25 which compares with the same period of 1921, with $182,784,798.12 as an increase of approximately 25 per cent.

The huge building program in Los Angeles continues to be one of the dominant factors in keeping up the sales of electrical supplies, however, this is true of other portions of Southern California as witnessed by the city of Long Beach breaking all previous building records with a total in excess of $12,000,000 for the 10 months of this year. The same condition exists in other cities and is keeping this section in the forefront of the nation's business.

The sale of electrical appliances both large and small, continues with increased results. This is partially due to the stimulus of fall and Christmas trade, but also to the increased use of electrial devices for the home. The huge advertising campaigns that are being conducted by some of the leading manufacturers and jobbers are rendering invaluable aid in increasing sales.

The conduit situation is improving though slowly and the demand, on account of increased building construction is ever on the up-grade. The sale of radio apparatus is improving and a large volume of business is expected during the coming month.

Portland

Generally speaking, business in Portland district continues good with nothing to fear for the future. The car shortage which has lasted for two months has been a big disturbing factor, with no immediate relief in sight. Coming as it did at a time when crop movements were heavy, the fruit growers, and particularly the apple men have suffered considerable loss. In the lumber industry a recent canvass showed that on an average, the 2 mills were getting only 30 per cent of their car requirements. As the production of lumber is still about normal the stocks are accumulating. From one-third to one-half of the lumber shipments from Portland are moving by water.

Retail business in Portland is at least normal with a strong demand for retail stores. Bank clearings for October showed a healthy increase over the same month of 1921. Postal savings are on the increase. An excellent holiday trade is expected. The power companies of Portland are still working large gangs in an endeavor to catch up with the new extensions. Ranges are moving well. Figures for daily generation of energy are continually breaking all former records with the usual time for the winter peak several weeks ahead.

Figures just issued by the shipping board give the port of Portland second place of all the Pacific Coast ports, when considering total cargo transactions both cleared and entered.

Salt Lake City

Approximately $6,000,000 was distributed on Nov. 15 by sugar manufacturers among the beet growers of Utah and Idaho, representing, in most instances, the initial settlement on the 1922 sugar beet crop. This settlement covers October beet deliveries on the basis of a guaranteed minimum of $5.00 a ton. Indications are that the farmers will receive an additional $2.00 per ton for their beets. Another settlement will be made Dec. 15, covering November deliveries; and still further adjustments will be made later to take care of the additional $2.00 per ton.

The distribution of this sum in actual cash means much for the intermountain section at this particular time, and is immediately reflected in an easier financial situation.

Most merchants, both wholesale and retail, report an increased volume of business as compared with the same period a year ago.

Electrical jobbers also report business as improving. The sale of appliances is fairly satisfactory. Credit conditions and collections are continuing to show some improvement.

The mines are turning out large quantities of ore, with every indication that conditions in this industry will continue satisfactory.

Seattle

City building permits for the month of September totaled almost $2,500,000 setting a record for one month in building construction. Incomplete returns from other Northwest centers indicate that the volume of building construction shows no signs of let-down as winter approaches.

Farmers have felt the car shortage acutely, apple shipments in particular being delayed. Favorable weather conditions for harvesting of crops is noted in all sections of the state, and the tonnage in most cases is greater than in 1921. Statements from the department of public works indicate that early relief may be expected in the car situation.

Lumber production is being maintained, and the demand continues good, with a steady market. Lack of cars is still seriously hampering the inland mills, but water shipments have absorbed the stocks of the coast mills, Over a billion more feet of lumber were shipped through the ports of the Pacific during the first nine months of 1922 than during the same period of 1921.

Denver

Several snow storms, including a near blizzard, have had a dampening effect on business, especially in the construction and agricultural lines, during the past fortnight. Although the moisture is of untold value to the farmers, there are a number who have suffered in delivering beets to the sugar factories and in getting farm products to the railroads. The latter, however, have been delayed materially but it is believed that transportation facilities will be back to normal in the course of a month or so.

Electrical jobbers report prospects for splendid Christmas business. Present stocks are moving but on unusually close margins, especially conduit, armored cable, and wiring devices. Considerable competition is still evident in small house wiring jobs. Several sharp reductions have been made by local lighting fixture dealers. Heating appliances are moving easier, also portable lamps.

Construction News

Bridges

Ariz., Prescott—County highway commission has advertised for bids for constructing a steel bridge across Agua Fria, to handle traffic over the Black Canyon Road. The bridge will be of the steel truss type, 231 ft., in two spans.

Calif., Santa Ana—County supervisors have adopted plans for a 524-ft. bridge across the Santa Ana River as part of the state highway link between Huntington Beach and Newport Beach. Estimated cost, $50,000. Structure will consist of three 60-ft. spans, Warren steel trusses resting on concrete piers. At each end will be 31-ft. bents of concrete pile construction. The structure will be 24 ft. wide. J. L. McBride, county engineer.

Colo., Denver—A. K. Vickery, city engineer, has announced the authorization of $40,000 to cover the construction of a new concrete bridge over Cherry Creek at Eleventh Avenue. Plans and estimates have been completed and bids will be opened early in December.

Ore., Portland—At the recent election two measures were passed upon for the bonding of the city in the amount of $1,600,000 for the construction of the Ross Island bridge and $3,000,000 for the construction of the Burnside bridge. A conference between members of the county commissioners and District Attorney Meyers has been held to determine just what steps are necessary for the construction of the two bridges.

Wash., Seattle—The city council has issued a call for bids for the superstructure of the West Spokane Street bridge, the bids to be opened Dec. 8. Sixteen firms have thus far signified their intention of bidding on the work, which includes the fabrication and erection of the superstructure, machinery, and electrical equipment for the bridge. The structure will comprise a double-leaf bascule span, approximately 288 ft., center to center of trunnions as per plans, two approach spans about 140 ft. long, and a steel girder span about 136 ft. long. The width of the bascule span will be 45 ft. center to center of trusses and of the side spans 52 ft., center to center of trusses, and of the girder span about 40 ft. Four plans for bids are outlined as follows: Plan No. 1—calls for the furnishing of materials and erection of bridge ready to operate, estimated cost $440,000; plan No. 2—furnishing of all material delivered on the job, estimated cost $270,000; plan No. 3—furnishing of electrical equipment only, estimated cost $22,000; plan No. 4—work of erecting what is furnished under plans Nos. 2 and 3, at an estimated cost of $144,000. The sub-structure contract is now being carried out by J. A. McEachern Company, at a cost of $265,000. The bridge with approaches, viaducts, etc., when completed, will cost $1,000,000.

Dams

Calif., San Diego—City council has appropriated funds for purchase of flush gates for Lower Otay and Barrett dams. Cost, $16,526. H. N. Savage is engineer on the dams.

Calif., Los Angeles—Contracts for the gates at the San Dimas and Live Oaks dams, new flood-control projects, have been awarded by the Board of Supervisors to the Llewellyn Iron Works for $17,000. The gates are to be built within 30 days. The gates at San Dimas are 4 by 6 ft. in size and are to be placed in 90 ft. of water. Those at Live Oaks are each 3 by 4 ft. and are to go in 60 ft. of water. The San Dimas dam is virtually completed, at a cost of $485,000. The Live Oaks dam will cost $150,000.

D. C., Washington—A new contract between the government and the Canyon Power Company of Nevada, which, if agreed to by both parties, will result in early construction work on the proposed Springs Reservoir in the Newlands project, Nevada, has been submitted by the reclamation service for the approval of the secretary of the interior. The agreement provides for a ten-year renewal of the lease the power company has on Lahontan power plant, which is to expire Dec. 1, 1924.

Ore., Medford—A new reservoir is to be built to cost about $35,000. The plans and specifications, on file in the office of the city recorder, call for a reservoir of cement with a capacity of 2,000,000 gallons. F. N. Cummings is the engineer in charge.

Wash., Tacoma—The City of Tacoma was recently granted permit to construct a dam on the north fork of the Skokomish River and divert the waters of the river for the generation of electric power, the permit being granted by Marvin Chase, supervisor of hydraulics, and represents a forward step in the city's development of the Lake Cushman project. The way is now open to proceed with the first engineering work on the dam and first unit installation, which will be at the dam, and the granting of the permit marks the end of a two-year fight by the city through the courts. The permits grant the right to construct a reservoir on the Lake Cushman site which will contain 190,000 acre-feet of water, giving a flow of up to 1,000 sec.-ft., and an estimated average flow capable of generating 64,545 continuous horsepower. Estimated cost of the reservoir is $1,768,000.

Highways

Ariz., Phoenix—The proposition to increase the bonded indebtedness of Arizona for constructing approximately 95 miles of paved highway as a connecting link in the Phoenix-Los Angeles road, carried at the election Nov. 7.

Ariz., Prescott—County highway commission will call for bids at once for construction of northern end of the Prescott-Ash Fork Road. The work has been approved by the U. S. Bureau of Public Roads.

Ariz., Phoenix—Arizona state highway department has started the construction of about 30 miles of road from a point 4 miles north of Marinette to Wickenburg on the road north from Phoenix, through Prescott. Contract for this work was let by the Maricopa county highway commission to the state department at its bid of $165,000, the amount set aside by the commission for the work. A large amount of rock excavation will be necessary on that part of the road from Marinette to Hot Springs Junction. It is stated that the U. S. Bureau of Public Roads has approved federal aid for this project to the amount of $205,000, which will be available in addition to the $160,000 appropriated by Maricopa county and the amount to be expended by the state on the 4-mile section at the Marinette end of the road.

Ariz., Phoenix—The proposition to bond the state for $2,500,000 for the building of a paved highway from near Phoenix to the Colorado River opposite Blythe, failed at the recent election.

Ariz., Yuma—Until Dec. 4, bids will be received by Yuma county highway commission for paving the Yuma County highway system from Yuma south, with asphaltic concrete base and wearing surface. This will be a cash job and progress payments of 90 per cent on monthly estimates will be made. Contract will amount to approximately $500,000. Plans and specifications may be obtained from Norman B. Conway, highway engineer, on payment of $25.

Calif., Huntington Beach—Bids for constructing the coast boulevard between Huntington Beach and Newport, will be advertised for about the latter part of December, according to N. D. Darlington, state highway commissioner. J. L. McBride, county engineer, of Santa Ana, is now securing rights-of-way, which will be 100 ft. to provide for future widening. Orange County will build a concrete bridge across the Santa Ana as part of the route. The bids on the bridge will not be received until March.

Calif., Long Beach—The section of the Coast state highway between Long Beach and Huntington Beach, 7.7 miles, will cost approximately half a million dollars, including bridges. Los Angeles county will build a $100,000 concrete bridge at Belmont Shore Place and a $75,000 concrete bridge at Naples, while Orange County will build a pile bridge 700 ft. long at Anaheim landing. Grading and paving of the highway will cost approximately $290,000. Construction of the bridge at Belmont Shore Place is under way and paving will be started very soon. W. M. Ledbetter & Co. of Los Angeles, are building the bridge and H. H. Peterson, of Loma Portal, has the paving contract.

Calif., Los Angeles—City engineer has been instructed by city council to start new proceedings for the improvement of the 5th St. district in San Pedro. The grading alone will amount to $300,000, with a total of about $1,000,000. Former bids were rejected and it is hoped to reduce the cost in new proceedings.

Calif., Los Angeles—County supervisors will improve main highways leading into Los Angeles. Estimated cost, $150,000. They are Cahuenga Pass grade, $100,000; Glendale Blvd., $10,000; Palms and National Blvd., $10,000; Western Ave., $7,000; Indiana St., $15,000; and Alhambra Ave., $8,000. Agreement was reached between supervisors and board of public works.

Calif., Los Angeles—County road department will file plans with county supervisors in about two weeks to pave about 23 miles of road from Palmdale through Little Rock, R. D. I. No. 137, involving about 17 miles of 18-ft. wide asphalt concrete, 5 in. and 6 in. thick, 3 miles disintegrated granite pavement 18 ft. wide, 6 in. thick, and 3 miles graded roadway. Estimated cost, $500,000. It will probably be two months before the hearing is held.

Calif., Santa Monica—Santa Monica's proposed bond issue of $1,200,000 to open and widen streets failed by 105 votes. Most important of the projects included in the city's big street improvement program was the opening and widening of Trolley way, in continuation of the Coast state highway through Santa Monica and Venice. A mass meeting of citizens will be held soon to consider what may be done to carry out this project, which is regarded as vital to the future development of Santa Monica.

Calif., Sacramento—A call for bids on the following additional road building projects has been issued by the state highway commission, bids to be opened here on Dec. 11: Siskiyou County—Between Granada and Yreka, 8½ miles to be graded and paved with either Portland cement concrete, asphalt concrete or asphalt macadam. Siskiyou County—Between two miles south of Hornbrook and the Oregon state line, 9.8 miles to be graded. Placer County—Between Roseville and Lincoln, five miles to be surfaced with asphalt concrete. A day labor crew is at work at present on this stretch of

road laying concrete shoulders which will result in adding about five feet to the width of the highway. Glenn County—Between Willows and a point three miles south of Glenn, 11.9 miles to be graded and surfaced with gravel. This unit forms a section of the Willows-Oroville road, which has been the subject of a number of conferences before the highway commission. Sonoma County — Over Northwestern Pacific railroad near Lytton, construction of a bridge consisting of 32-ft. reinforced concrete girder spans. Santa Clara County—Between five miles east of Gilroy and San Felipe, four and one-half miles to be graded and surfaced with gravel. Fresno County—Between Parkfield Junction and Coalinga. 8.9 miles to be graded.

Calif., Sacramento—Six new units of road work, including the grading of almost twelve miles on the Tahoe-Ukiah road in Nevada County, are included in a call for bids just issued here by the state highway commission. The bids will be opened at the Sacramento office of the commission on Dec. 18, and it is probable that contracts, at least for part of the proposed work, will be awarded before the close of the year. The grading work in Nevada County will extent from Nevada City eastward to little Deer Creek, constituting the first construction to be undertaken on the Tahoe-Ukiah road east of units in Sutter County. The stretch is through a mountainous country for the entire distance. The call also provides for the submission of proposals for widening and thickening the highway in Yuba County, between Morrison's crossing and a point one mile south of Marysville, a distance of approximately eight miles. Shoulders to be added to the present highway will increase its width of twenty feet, and the base of the whole paved with asphalt macadam. Other units covered in the call are as follows: Contra Costa County—Between Hercules and Rodeo, 1.8 miles to be graded and paved with Portland cement concrete. San Benito and Santa Clara Counties—Between Hollister and Pacheco Pass, 8.2 miles to be graded and paved with asphalt macadam. Madera County—Between the westerly county boundary and Califa, 14.2 miles, to be graded and paved with asphalt macadam. Ventura County—Between a point 3¼ miles southeasterly from Hueneme Road and Rindge Ranch, 7.4 miles, to be graded. On Dec. 11 the commission is scheduled to open bids on seven additional projects, most of which are located in Superior California.

Idaho—Pocatello—Contract for the section of the new state highway between Pocatello and Batise Springs has been awarded to the Deluvik-Orino Construction Co. of Spokane on a bid of $26,815. The construction includes a bridge across the Portneuf River with a span of 90 ft. Work will start about April 1, 1923.

Ore., Portland—The state highway commission has awarded contracts for 27.47 miles of road work, amounting to $400,608, and has under consideration 27.89 miles, amounting to $217,982, pending adjustments. On the Ashland-Klamath Falls highway the commission had 34.29 miles up for bidding. The Hayden Creek-Keno section in Klamath County, consisting of 12.12 miles of grading, was awarded to John Hampshire for $114,097, subject to the approval of the secretary of agriculture. Two other units of the same highway, 12.34 miles of surfacing in Jackson county and 9.82 miles of surfacing in Klamath, have been referred to the engineer pending adjustment of details. S. S. Shell is low bidder on the Jackson County end, his bid being $79,210, and W. C. Stone was low man for the Klamath surfacing, his bid being $65,110. The government wants the grade widened on the Jackson County part. Alsea mountain, the worst section of the Alsea road, between Corvallis and Waldport, is to be graded for a distance of six miles. The award was made to Joplin & Eldon for $204,669. This section is located in Benton County. Contract for the Dalles-California highway has been awarded to Moore & Anderson to grade 9.35 miles and surface 15.65 miles in Jefferson County from the Wasco county line to Madras.

Utah, Salt Lake City—The contract for the construction of a new highway through Sardine canyon, in Cache County, from the end of the present pavement at Wellsville to the Boxelder county line and for surfacing the new road, 6.962 miles long, with gravel, will probably go to O. Nelson, under bids which were opened by the state road commission at the state capitol. Mr. Nelson's bid, with costs of materials furnished by the state and a 10 per cent allowance for engineering, inspection and contingencies, totals $114,613.38, according to present estimates of quantities. This is at the rate of $16,462.71 per mile, which figures out about the most expensive of any gravel road as yet constructed in the state. The roadway is for practically the entire distance through a canyon and a very considerable amount of difficult construction is required.

Utah, Salt Lake City—Utah's share of the $150,000 being raised for work on the Victory transcontinental highway will be spent on the completion of the Wendover cutoff running for 126 miles between Salt Lake City and the Utah-Nevada line.

Utah, Salt Lake City—Contract for federal aid project 41, the construction of a gravel-surfaced road from Morgan to Peterson, 7.798 miles long, in Morgan County, was recently awarded to the Western Engineering and Construction Company by the state road commission. This company submitted the lowest bid of nine received, totaling $49,433.90. With cost of materials furnished by the state and 10 per cent additional for inspection, engineering and contingencies, the total cost is brought to $61,130.30. Of this the county pays $15,741.05 and the federal government the remainder.

Utah, Salt Lake City—Work on the contract for the Magna-Tooele county line paving project, which was awarded some time ago to the Moran Paving Company, will start at an early date. The pavement will cost about $215,000, of which Salt Lake will pay 26 per cent and the federal government the balance. Preston G. Peterson is chairman of the state road commission.

Utah, Salt Lake City—Bids have been opened by the state road commission for the construction of 7½ miles of gravel surfaced road from Heber City to Hailstone, on the Summit County line, serving the mining companies over the ridge from Pork City. Contract for the road work proper was awarded to the Gilkerson Construction Company. Christensen, Jacobs & Gardner have the contract for the erection of a "pony truss" steel bridge of 63-ft. span over the Provo River. The Gilkerson bid, including state's cost for materials and the inspection allowance, figures $68,904.86. The birdge bid was $11,985.16.

Wash., Everett — Norris Bros. of Burlington, on a bid of $75,000, received the contract for 1½ miles of grading, construction of a one-mile trestle and a boom guard.

Wash., Ephrata—Majotte & Winters, Spokane contractors, have been awarded contract by the Grant county commissioners for the construction of two miles of highway from Vantage Ferry south toward Beverly, on their bid of $39,650.

Wash., Mount Vernon—Skagit County's road program for the coming year includes two important projects, on which bids will be called during the month of December. The first is the paving of the Edison-Bow road, a distance of three miles; the second is the paving of 2.4 miles of highway in L. I. D. No. 10. In both cases, 16-ft. concrete pavement will be laid. Frank Gilkey is county engineer.

Irrigation Projects

Calif., Merced—Plans calling for the expenditure of approximately $150,000 for the sinking of thirty additional drainage wells and furnishing them with pumping and other equipment were approved by the board of directors of the Merced irrigation district. In approving the plans of Engineer Rex C. Starr for the drilling of 30 wells in addition to the five which are already in operation in the district north of Merced, the directors adopted a resolution requesting the state bonding commission to authorize the work. The pumps placed in the wells are capable of delivering 125 sec.-ft. of water.

Calif., San Diego—Santa Fe Land & Improvement Company (subsidiary of the A. T. & S. F. Railway), Ed. Fletcher and Margaret A. McClure have filed a petition with the State Department of Public Works to form an irrigation district including about 7,000 acres of the San Dieguito Ranch. It is proposed to furnish water for these lands from Lake Hodges Dam.

Calif., Oroville—The Oroville-Wyandotte Irrigation District unanimously authorized the issuance of $2,000,000 in bonds at a recent election. The bonds will provide for construction of reservoirs, dams and similar work by the district and for the purchase of the South Feather Land & Water Co. and the Palermo Land & Water Co. rights and holdings. Construction of the first unit of the district will be advertised before the first of the year. The Lost Creek and Palerm reservoirs are planned to be completed by the next irrigation season. It is estimated that water will ultimately be provided for 50,000 acres.

Wash., Pomeroy—The Northwest Development Company of Spokane is promoting a project to irrigate 25,000 acres in Garfield and Columbia counties, at at an estimated cost of $75 per acre, making the entire project cost $2,000,000. Two tunnels would be necessary, one of 750 ft. and the other 1,000 ft. through rock points, and in the mountain district the flume will be concreted. L. H. Lightner is manager of the development company.

Wash., Spokane—The Spokane Irrigation District, at a recent election, voted, 135 to 53, for a new cast iron domestic and irrigation water system, to be covered by a $75,000 bond issue.

Wash., Yakima—The Rimrock irrigation project will provide work throughout the winter for about 300 men, according to F. T. Crowe, construction engineer. Cold weather will not interfere with the work of three steam shovels. About 140,000 cu. yd. of rock will have to be moved from the fact of the spillway. According to the present program, the reservoir will be filled and the storage made available for the irrigation season of 1925.

Power Plant Equipment

B. C., Vancouver—The British Columbia Electric Railway Company will build an automatic substation on Bodwell road, between Main and Fraser Streets, Vancouver, at a cost of $65,000. It is to be a substantial brick structure, and work on it will be started at once. This is believed to be the first automatic electric substation to be erected in Canada.

Calif., Venice — Southern California Edison Company has secured a permit to erect a fireproof structure on Virginia Ave. near Zena Place. The building will be equipped with a substation, being supplied from Culver City and Ocean Park. The building will cost $13,500 and electrical equipment $40,000.

Calif., Los Angeles—Washington officials are considering an application by Los Angeles to erect a power house on the aqueduct at a point known as Haiwee Narrows. The proposed power house will have a capacity of 6,400 hp.

Calif., Los Angeles—Indicating the rapid and intense development of the southwest portion of the downtown business district in Los Angeles, the municipal bureau of power and light, under direction of Chief Electrical Engineer E. F. Scattergood, is now completing the installation of new electrical facilities in that district costing approximately $150,000. Increasing demands for electric energy in the area bounded by Sixth Street on the north, Figueroa Street on the West, Twelfth Street on the south, and Broadway on the east, has resulted in the extension into this district of several new electric cable lines by the city's power bureau. Already the laying of a $75,000 electric conduit along Figueroa Street between Sixth and Eleventh Streets has been completed. The bureau is now engaged, it is stated, in the laying of a $75,000 cable and transmission line along Eleventh Street between Figueroa and Hill Streets. Reliable electric service of the highest quality will be assured the downtown business district by the establishment of a new $200,000 electric substation at 926 Francisco Street, it was stated by Mr. Scattergood. In laying out the new electric cable and transmission lines along Figueroa and Eleventh Streets the bureau of power and light is making advanced preparations for the serving of electric energy to the new Chamber of Commerce Building and the new Elks' clubhouse, in addition to meeting the rapidly increasing demands in that district on the part of new office buildings and commercial establishments, it was explained.

Power Projects

Calif., Watsonville—By a vote of 1,194 to 83 Watsonville authorized a bond issue of $225,000 for the purchase of the plant and distributing system of the Watsonville Power Company. The bonds will run for 25 years and draw 4½ per cent interest.

Wash., Seattle—Contract for clearing right-of-way for transmission line, section No. 7, Skagit power project, has been let to S. A. Dahlberg, Seattle, on his bid of $24,692.

Wash., Everett—The Delta Electric & Water Company is seeking permission from the city to install poles and string lines for the distribution of power in the city. The company, which is headed by Frank MacKean, is also seeking an agreement with the city whereby the city has the option, at any time, of taking over, by condemnation or other procedure, the distribution and equipment installed, buying power from the company and selling it to those under contract with the company. The option would run from Jan. 1, 1924, to Jan. 1, 1927, after which time it becomes void. The agreement and permit would also be void if the electric company fails to establish and operate in Everett by Jan. 1, 1924. The company, according to the president, is at present constructing a 12,000-hp. plant on Pilchuch Creek, which is expected to be ready for operation Nov. 1, 1923.

Railways

Ariz., Kingman—The Sharp-Fellowes Contracting Company, Central Bldg., Los Angeles, which has the contract for the Yampai-Griffith double tracking on the Santa Fe railroad, has received a second contract for an additional track between Griffith and Topock. This will bring the double track as far as the Colorado River and will give the company two sets of rails nearly all the way through Arizona. In the new work, which will cost about $2,500,000, several curves will be eliminated, but in general the new line will follow the old grade. It is understood that the only remaining single track section, that between Bagdad and Daggett, will be double tracked within three years. A sub-contract for 25 miles has been let to James Martin of Kingman.

Calif., Metz—Utah Construction Company has been awarded contract by Southern Pacific Railway at $200,000 to construct a reinforced concrete tunnel on the coast line near Metz, Monterey County. Work will involve 171,000 lb. reinforced steel, 4,340 cu. yd. concrete, 85 tons or 6,278 lin. ft. new 90-lb. rails, 1,700 redwood cross ties, 3,050 10-in. tie plates, and 2,000 cu. yd. ballast.

Calif., Glendora—Application has been made by the Pacific Electric Railway Company to the California Railroad Commission for permission to build a line through the Glendora foothill country to a connection with the company's San Bernardino line at Lone Hill. The line will be 5 miles long and will cost approximately $400,000. It will make possible new passenger service via South Pasadena to San Dimas and San Bernardino. Plans for this project were made before the war, but were held up and it is the first important extension to be made by the company since the war.

Calif., Los Angeles—Double-tracking of a part of the Temple Street line west of Park View will shortly be begun. The new double track will be laid from Park View to Fountain and Virgil Avenues, where at present a single line operates. The only part of the route that will be left single track is from Fountain and Virgil Avenues to Fountain Avenue and Edgemont, and the existing track will undergo a reconstruction. This is the biggest track reconstruction job involving intricate special work undertaken by the Los Angeles Railway since the rerouting of lines in 1920. Work will be begun in the near future, and will be carried out at night with the aid of two derricks and a large force of men.

Calif., Calexico — Southern Pacific Railway plans a standard gage line from Mexicali to tidewater on the Gulf of California, 65 miles. The new line will tap the rich cotton lands in this district. Construction will start the coming winter, according to J. D. Isaacs, company engineer, at present in Calexico, making survey. The gulf terminus is Labomba.

Idaho, Boise—The city of Boise has accepted the offer of the Oregon Short Line to build a railroad track from Orchard to this city. The company will build a new passenger station as well as 27 miles of new trackage, with bridges and tunnel and will enlarge its freight terminal facilities in Boise and will spend approximately $3,200,000 in and near Boise. The city will be required to raise approximately $400,000 to cover its part of the agreement which provides that Boise purchase and deed to the Oregon Short Line the right-of-way for the railroad on the bench, estimated to cost $75,000; that it deed to the Oregon Short Line the citizens' right-of-way and raise a trust fund of $325,000, the interest from which may be used to pay taxes on the newly constructed line in the event they shall be in excess of $10,000 per mile, this fund to be held in trust for a period of twenty-five years. Carl R. Gray is president of the railroad company.

Idaho, Pocatello—The Oregon Short Line will soon begin construction of a new freight depot and office building at Montpelier to take the place of the building destroyed by fire last spring. The contract for this building has been let to the Burke Engineering Company of Salt Lake City. The plans call for a structure 328 ft. long and about 35 ft. wide. Part of the building will be two stories high and will contain office rooms for the assistant superintendent, roadmaster, chief dispatcher and others.

N. M., Columbus — Colorado, Columbus and Mexican Railroad Company, a new corporation, has filed papers with interstate commerce commission, Washington, D. C., involving construction of a 550-mile railroad between Columbus and Farmington, New Mexico, with branch lines to El Paso, Texas and other points. Permission is asked for a $20,000,000 bond issue and a $5,000,000 common stock issue.

Ore., Klamath Falls—Contract for construction of 12 miles of the Strahorn Railroad from the present terminus near Hildebrand to Sprague River, has been let to the Nettleton, Bruce, Echbach Co. of Seattle, at a contract price of approximately $175,000. The railroad is to be completed to Sprague River in May, 1923.

Wash., Port Angeles—Announcement has been made that the Clallam Lumber Company and the Bloedel-Donovan Lumber Company are prepared to log their six billion feet of timber between Fairholme and Quillayute Prairie, and would have engineers in the field, beginning shortly. Work on construction of the railroad will commence in the spring of 1923 with a large crew of men placed for railroad construction, and another crew placed in the woods for logging work.

Wash., Tacoma—The Puget Sound Electric Railway has completed plans and will start work at once on the new interurban station to be erected at South Eighth and A Streets, to cost $20,000, and to be of brick and stucco construction.

Wash., Hoquiam—The R. R. Smith Lumber Company has finished 2½ miles of grading and is ready to build a logging railroad. Plans are under way to build 225 bungalows and install a better electric light plant with an estimated cost of $2,200,000.

Wash., Walla Walla—A 50-year franchise was recently granted to the Walla Walla Valley Railway to construct a line 3 1/3 miles long, branching from College Place to run through fruit and garden land south and west of the city. The O-W. R. & N. Co. filed application for a franchise over the same ground. Hearing has been set for Dec. 22. Commissioners announced that this second franchise would be granted as the O.-W. R. & N. Co. and the electric road have come to an agreement. Work on the road will start immediately.

Street Lighting

Calif., San Bernardino—Thomas M. Holland was awarded contract for the construction of the ornamental lighting systems on E and F Sts., price, $13,641.81, involving reinforced cement concrete posts, brass globe holders, 8 x 16-in. opalescent globes, Mazda lamps, sockets, wiring, etc.

Calif., Carpinteria—Chamber of Commerce has petitioned the Santa Barbara county supervisors for a lighting district, which will probably include a larger area than the town proper.

Calif., Santa Monica—Engineering department has completed plans and specifications for ornamental lighting system for Santa Monica Blvd. The system will comprise six lights to the block, the posts to be of Grecian type, 20 ft. overall, with two lamps of holophane glass, carrying 500-watt globes. An ordinance will be presented to the council at once.

Calif., Los Angeles,—Bids are being received by board of public works for ornamental light posts complete on Central Ave., between 50th St. and Slauson Ave. Certified check or bond, 10 per cent.

Colo., Denver—The Mutual Oil Company, operating a refining plant and a number of automobile filling stations, is planning on the early installation of ornamental lighting standards at all its properties in the residence district, according to L. E. Thorpe, the local manager.

Wash., Aberdeen—The city's new boulevard lighting system is to be installed early next spring, according to the city's lighting committee, and bids for installing the system will be called in the near future.

Calif., Riverside—City council has adopted an ordinance of intention to construct electric lighting system of Cedar Street between First and Fourth Sts. C. R. Burns, city clerk.

Calif., Los Angeles—Bids are desired by the Briggs Company, 8225 Sunset Blvd., subdividers, for ornamental lighting system for new subdivision on Sunset Blvd. Bids are also desired by the same people on ornamental iron fencing.

Calif., Visalia—Chamber of Commerce plans movement for electroliers on 9 additional blocks in business section. The project will be presented to city trustees at once. A survey has been made by J. M. Dodds, engineer for the General Electric Company. Plans call for six standards to a block.

Streets and Sewers

Ariz., Holbrook—A. E. Thompson, Phoenix, Ariz., has been awarded contract at $14,000 to construct city sewer system. Work will start at once.

Calif., Newport Beach—City trustees are planning a new sewer system and septic tank for Balboa Island. Paul E. Kressly, H. W. Hellman Building, Los Angeles, consulting engineer.

Calif., Turlock—The $25,300 sewer bond issue carried at the election, Nov. 13. The issue includes $20,000 for constructing 4-ft. concrete pipe line from present sewer disposal plant to Chatom drain, 3 miles west of present farm; and $5,000 for extending main trunk sewer lines.

Calif., Coronado—City Manager Hyatt reports plans under way for paving of streets in that section of the city known as the flats, comprising parts of 5th and 6th Sts., Margarita Ave., Miguel and other avenues. Estimated cost, $150,000.

Calif., Los Angeles—Los Angeles Board of Public Works expects to reduce the cost of the proposed Arroyo de la Sacatel'a storm drain in the northwestern part of the city by eliminating sections of the proposed system and starting new proceedings under the state improvement act of 1913, which would permit progress payments to be made on the work instead of requiring the contractor to finance it to completion. Revised plans are now being prepared by the city engineer. It is expected the original estimated cost of approximately $3,000,000 will be reduced by $1,250,000.

Calif., San Francisco—Bids for the construction of the north half of the Sloat Boulevard between Nineteenth and Thirty-fifth Avenues, estimated by City Engineer M. M. O'Shaughnessy to cost $52,000, have been called for by the board of public works. The bids will be received December 6 by the board. Plans and specifications for the work were prepared by City Engineer O'Shaughnessy and transmitted to the board.

Calif., Chico—The city engineer has been ordered by the city trustees to draw up plans for twenty-two blocks of paving proposed to be constructed at an estimated cost of $150,000.

Colo., Denver—The Frank B. Varnum Construction Co. has been awarded contract for putting in the footings of the new Sixteenth Street viaduct on a bid of $58,401.50. Work of tearing down the old viaduct has already started.

Wash., Seattle—Romano & Company, on a bid of $14,751, received the contract for installing water mains on East 45th Street, et al. The work involves approximately 2,500 ft. of cast iron pipe, 8 to 16 in. in size.

Wash., Tacoma—The city council has awarded to the American Cast Iron Pipe Company a contract for furnishing cast iron pipe to be used in construction of South J and K Streets trunk water main on their bid of $46,119.15.

Wash., Seattle—Hauge & Espaland, here, on their bid of $96,185, were low bidders for the paving and trestle work on Railroad Avenue. Four other bids were submitted, the highest being $99,803.

Wash., Sdmonds—City clerk George M. Leyda has issued an official call for bids for laying 14,956 sq. ft. of concrete sidewalks on Sixth Street, bids to be opened Dec. 5.

Wash., Seattle—The board of public works has awarded to Fiorito Bros. contract for the paving of Alki Avenue, on their bid of $112,309. The work involves the laying of 35,800 sq. yd. of 7-in. concrete paving and installation of approximately 16,000 ft. of concrete curbs, in addition to 12,600 cu. yd. of grading. This is the second call for bids on this contract.

Wash., Seattle—Contract for paving of Taylor Avenue has been let to J. L. Smith, on his bid of $32,769. This job involves the laying of 3,500 sq. yd. of 7-in. concrete paving and 2,600 ft. of concrete curbs.

Waterworks

Calif., Ventura—Plans and specifications for the reservoir site and pumping plant to be used by the new water company have been accepted by the board of supervisors and bids for same have been called for. Chas. W. Petit, county surveyor.

Calif., San Diego—Escondido Mutual Water Company and the San Diego County Water Company have executed a contract for water development and construction work in the lands surrounding Escondido. The plans contemplated by the agreement provide for an immense conduit, including tunnels, utilizing the present conduit of the Escondido Mutual Water Company on the San Luis Rey River, to the Bear Valley reservoir, about six miles east and north of Escondido, to have a capacity of 45,000,000 gal. of water per day. The Bear Valley reservoir is to be strengthened and its capacity enlarged. When the conduit is completed the San Diego County Water Company is to erect an electric power plant at or near the intake where there is a drop of several hundred feet.

Calif., Los Angeles—Two bond issues were sanctioned by the voters of Los Angeles city—$5,000,000 for construction of new trunk lines and additional reservoirs for the city water system. There will be no increase in taxes on account of the water bonds as the board of public service has promised to pay the principal and interest out of the earnings of the department.

Calif., Watsonville—A bond issue of $225,000 for the purchase of the plant and distributing system of the Watsonville Water Company was authorized by the voters at a recent election.

Wash., Bucoda—The city council has awarded to the American Wood & Pipe Company a contract for construction of the new water system for the town. The system will include two 60,000-gal. reservoirs, and will cost about $25,000.

Miscellaneous

Calif., Long Beach—Wharf—Union Oil Company will start work at once on an 800-ft. wharf on the tide lands north of the drawbridge; site under lease. Estimated cost, $200,000.

Calif., San Diego—Pier—Plans will be ready Dec. 15 for first section of the new mole-type pier, according to an announcement of Frank G. White, chief engineer of the port of San Francisco, who is under contract with the city of San Diego to do the preliminary engineering work. The first work will consist of dredging and bulkheads. Material for the fill will be taken from the channel cut, saving much haulage. Estimated cost of the project, $1,000,000. As soon as the plans are ready, harbor commission will issue a call for bids.

Ore., Albany — Spruce Camp — Hoover & McNeil, local contractors, started on their contract to reconstruct the government spruce camp at Toledo, Ore., for the Pacific Spruce Company. The contract will involve 1,250,000 feet of lumber; installation of modern machinery and placing of up-to-date equipment in every way.

Wash., Seattle—Conductors—Poles—The board of public works has approved plans and specifications submitted by Chief Engineer C. F. Uhden of the Skagit power project, providing for the furnishing and installing of electrical conductors for one transmission line project, also for furnishing 900 cedar poles for 15 miles of the first transmission line. The conductors are estimated to cost between $250,000 and $300,000 and the poles between $10,000 and $15,000. Bids for both of above will be opened by the board on Dec. 8.

Wash., Seattle — Wharf — Construction of a wharf, 450 x 250 ft., has been started by the Associated Oil Co. The structure is to be completed by Jan 1. The plant, situated on a 7-acre tract fronting on the East Waterway, will consist of storage tanks, warehouse, garage, railroad spur tracks, office building and a 25-ft. cement retaining wall surrounding the tanks. Actual construction work is estimated to cost $750,000. A. J. McNeil, local resident engineer, is in charge of the operations.

Buildings (Industrial)

Ariz., Tucson—Ice Plant—T. J. Boettcher was awarded contract for erection of a $60,000 ice manufacturing and storage plant for the Arizona Ice & Cold Storage Company. Gay & Son were awarded the contract for the ice manufacturing machinery.

Calif., San Francisco—Factory—The Chamber of Commerce has announced that the Richard Hellman Manufacturing Food Products Co. of Long Island, N. Y., is making a $250,000 investment in factory and land in this city. The site is at 16th and Harrison Sts. The plant will have five floors, reinforced concrete. The basement will have tankage for immense quantities of vegetable oils. The industrial architect, A. Toriggino, will have charge of construction.

Calif., Los Angeles—Storage—Construction of two additional storage buildings in the Torrance yards of the Pacific Electric Co. to house rails and track materials will begin at an early date. The buildings will each be 125 ft. long and 66 ft. wide, on platforms 200 x 77 ft. D. W. Pontius is general manager of the road.

Calif., San Francisco—Warehouse—The Talbot Investment Company will begin construction of a two-story and basement reinforced concrete building on the northeast corner of Eighth and Natoma Streets. It will be equipped as a heavy material warehouse together with showrooms and office rooms for the George H. Tay Co., wholesale plumbing supplies. J. E. Krafft & Sons, architects.

Calif., Isleton—Cannery—A 14-acre site has been purchased here by the J. C. Butts Co. of San Francisco, who plan to erect a large cannery. Contract has been let and plans call for completion of the work by Feb. 1, 1923.

Calif., Orange—California Cordage Company is taking bids for constructing a cotton spinning factory to be built at Orange. Plans by H. M. Bomar, Los Angeles, representing Gregg & Co., national textile engineers, call for concrete building, 97 x 13 7ft., steel sash and cement floors.

Calif., Ontario—F. W. Edwards has the contract to erect a reinforced concrete factory building, 50 x 150 ft., at Main St. and Fern Ave., for Adams Record Cabinet Corp. The building will cost $10,000 and the equipment, etc., will represent an investment of over $40,000. L. R. Kennedy and E. S. Bidwell, local realty men, are interested in the work.

Calif., Los Angeles—Architect Chas. M. Hutchison, 427 Security Building, is completing plans for a 3-story brick factory building on Long Beach Ave. for Roberti Bros. Dimensions, 80 x 120 ft., mill construction, composition roofing, metal skylights, elevator, cement and wood floors.

Calif., Los Angeles—Architects John Parkinson and Donald B. Parkinson, 420 Title Insurance Building, have prepared preliminary plans for an addition to the Ford assembling plant at 2060 East 7th St. The building will be 1, 2 or 3-story, 150 x 350 ft., reinforced concrete frame and floors, brick filler walls, pressed brick and terra cotta facing, steel roof trusses, steel doors, steel sash, loading platforms, etc.

Calif., Bakersfield—C. A. Fellows, Central Building, has been awarded the contract for erecting an ice storage plant at Bakersfield for the Santa Fe Railway Company. It will be 82 x 340 ft., and 42 ft. high, inside dimensions; reinforced concrete construction, steel roof trusses, reinforced concrete and composition roofing, cork insulation, loading docks, conveyors, etc. Plans by engineering department of Santa Fe Railway Co.

Calif., Los Angeles—Sam Seelig Company, 1325 Palmetto St., has purchased a 5-acre site at northeast corner of Vernon Ave. and Alameda St. and will erect a central warehouse and manufacturing plant for its chain of stores. The main warehouse will be 4-story, 135 x 300 ft., class A reinforced concrete construction, steel sash, elevators, etc. Cost, $450,000. There will also be a bakery building, garage and manufacturing building. Other warehouses will be erected on the property later. Total cost will be about $750,000.

Calif., Glendale—Engineer Edw. T. Flaherty, 435 I. W. Hellman Building, has prepared plans for a 5-story class A furniture warehouse in Glendale, for Robinson Brothers Transfer & Fireproof Storage Company, 304 Brand Blvd., Glendale. Reinforced concrete construction, brick walls, 50 x 80 ft., concrete and maple floors, composition roofing, steel sash, wire and plate glass, elevators, wrought iron, storage rooms, metal doors, foundation for 8-story. Day work.

Calif., Wilmington—Architect Albert C. Martin, 430 Higgins Building, is preparing working drawings for a group of factory buildings at Wilmington for Pacific Coast Borax Company. Bids are being taken for reinforcing steel and plans will be ready for general bids about Jan. 1. The main building will be 2-story, 250 x 400 ft., designed for 5 stories. There will also be a power plant and several smaller buildings, 1 story each, and 900 ft. of wharfage, wooden pile construction. Main building will be reinforced concrete construction, flat slab system, composition roofing, metal skylights, wrought iron sash, steel rolling doors, fire doors, crushers, tanks, conveying machinery, 3 large elevators, etc. Cost, $1,000,000.

Calif., Los Angeles—Architect Albert C. Martin, 430 Higgins Building, is taking bids for erecting two class A factory and warehouse buildings on E. 7th near Anderson St., for J. C. Hills, to be occupied by Peck & Hills Furniture Company. Bids will be taken separately on general contract, elevators, sprinkling system, plumbing and heating, wiring and painting. Buildings will be 3-story and basement designed for three additional stories, 80 x 100 ft. and 135 x 350 ft., respectively; reinforced concrete construction, flat slab system, steel sash, metal skylights, steel rolling doors, 3 freight and 1 passenger elevators, fire doors, sprinkling system.

Calif., Pomona—Hamm & Grant, Inc., 607 Ferguson Building, Los Angeles, have prepared plans and will erect the first unit of a factory building at Pomona for Teetor Adding Machine Company, 502 Pacific Finance Building, Los Angeles. Work will be started in a few days. Building will be brick and steel with saw tooth roof construction, 100 x 300 ft., with a 2-story reinforced concrete office building, 35 x 100 ft., in a wing at the center.

Calif., Pasadena—K. V. Packing Company has broken ground for a meat packing plant at Lamanda Park, near Pasadena. W. S. Kelly has incorporated a company for $10,000. Ground has been broken.

Calif., Fresno—Fresno Paper Company will build a box-board factory and mill. Its capacity will be 40 tons daily.

Calif., Wilmington—Wm. A. Heitman Construction Company, 900 Merritt Building, has the contract on a percentage basis for the erection of an oil refinery near Wilmington, to cost $6,500,000, for the Shell Oil Company; the site covers about 1 sq. mile and the work will consist of power plant, pumping stations, tank farms, offices, garages, employees' quarters, store buildings, and road work. Work will start immediately. The general contractor desires bids on all sub-contracts.

Calif., Fresno—United Engine Machine Company has been incorporated with a capital of $250,000 and will build four buildings, including machine shop 150 x 100 ft., foundry and molding shop, 150 x 100 ft., pattern shop, 75 x 50 ft., and a forge shop, 75 x 50 ft. G. J. Dolan, Jr., and D. Sulprizio, owners.

Calif., Calexico—Gay Engineering Corporation has broken ground for an addition to the Imperial Ice & Development Company's plant, at Calexico. The addition will add 11,000 tons capacity to the plant.

Calif., Anaheim—Charles A. Criss, cement contractor, has secured a permit to build a cement manufacturing plant at 315 So. Vine St. Three buildings including an office, cement house, and a molding and caring shed, will be erected at once. Mr. Criss will manufacture cement brick and art concrete work.

Calif., San Bernardino—F. M. Cummings, 430 Chapman Bldg., has prepared preliminary plans for a class A warehouse building at Rialto and D Sts., San Bernardino, for Southern Terminal Warehouse & Storage Company, 804 Wright-Callender Bldg. Brick walls, concrete construction; $85,000.

Calif., Alhambra—Southern California Edison Company is having plans prepared by its engineering department for a group of warehouses and shop buildings to be erected at Alhambra. The buildings will include a main warehouse, 200 x 600 ft., warehouse, 100 x 400 ft., two warehouses 100 x 100 ft., and a shop building, 170 x 270 ft. Steel frame construction, steel roof trusses, steel sash, composition roofing, cement floors; $750,000.

Calif., Los Angeles—Union Pacific Railway Company is having plans prepared by its engineering department at Omaha for the shop buildings to be erected near Belvedere Gardens. Buildings will include a 50-stall roundhouse and a number of large shops of brick construction. Plans will be ready for figures early next year, bids to be taken through the local engineering department. Plans are being prepared by local engineering office for subdividing a portion of the industrial tract, the work to include about 1¾ miles of concrete and asphalt paving, 4,000 ft. of sewer, railway tracks, etc. Development of the machine shop tract will require about $100,000 worth of grading and installation of 30 miles of railway track.

Calif., Los Angeles—The Moran Company, 206 Kerckhoff Building, is preparing plans for a 1-story steel frame building at Washington and Stanford Sts. for W. Elmo Reeves. Brick walls, 100 x 145 ft., comp. roof, steel sash, metal skylights, concrete floor, wire glass, steam heating system, concrete foundation; $40,000.

Calif., Santa Paula—Architects Allison & Allison, 1405 Hibernian Bldg., are completing plans for a packing house to be erected at Santa Paula for Santa Paula Citrus Fruit Association, as an extension to its present building. It will be 1-story and basement, 150 x 350 ft., cement basement and foundation, hollow tile walls, reinforced concrete columns and beams, comp. sawtooth roof, wood floors; $200,000.

Calif., Visalia—California Packing Corp. will start work soon rebuilding plant No. 17, destroyed by fire a few months ago. Statements by officials indicate nearly one-half million dollars will be expended on the new buildings.

Calif., Los Angeles—Lepper & Laisy, 501 O. T. Johnson Building, have been awarded general contract at $44,600 for erecting a 2-story class C warehouse and factory building on Ave. 22 near Humboldt St. for W. P. Fuller & Co. Contract for elevator was let to Baker Iron Works and sprinkling system to Western Automatic Sprinkler Co. at $6,580. Hudson & Munsell, Douglas Building, architects. The building will be 120 x 125 ft., brick construction, pressed brick, plate glass, steel beams, comp. roofing, metal skylights, steel sash, cement and wood floors.

Calif., Los Angeles—Architects and Engineers Truesdell, Purinton & Newton, 304 San Fernando Building, are preparing plans for a 2 and part 3-story and basement reinforced concrete class A milk bottling and ice plant, near Jefferson and Hill Sts., for the Consumers Milk Company. Estimated cost, $200,000.

Calif., Torrance—Houghton & Anderson, 143 Rose St., have the contract for two concrete foundations and floors, 77 x 200 ft., for warehouses to be erected at Torrance for Pacific Electric Railway Company. Superstructures will be 60 x 125 ft., constructed of frame and corrugated iron and will be erected by Wurster Construction Company. Plans by Pacific Electric engineering department.

Calif., San Francisco—Barrett & Hilp, 918 Harrison St., have been awarded a contract for the construction of a two-story reinforced concrete addition to the factory of the National Ice Cream Company on Guerrero St. Contract price, $50,000. Plans were prepared by Architect W. Mooser, Nevada Bank Bldg.

Calif., San Francisco—Barrett & Hilp, 918 Harrison St., have been awarded a contract for the construction of a 3-story reinforced concrete factory and warehouse building, for the Simmons Company. It is to be erected on the northwest corner of Bay and Powell Sts. and will cost $250,000.

Colo., Denver—A $750,000 packing plant will be erected here shortly by the Blayney-Murphy Company, formerly known as the Coffin Packing & Provision Co. Plans have been completed, according to W. N. W. Blayney, president of the company, and with the necessary financing having been done, construction will start before the first of the year.

Colo., Denver—A new paint and varnish factory to cost $60,000 will be built at Twenty-sixth and Blake Streets by the McMurtry Mfg. Co.

Colo., Denver—Two ice storage buildings, at a cost of $100,000 when completed, are planned by the Denver Ice and Cold Storage Co., according to the plant manager, M. Charles Salet.

Colo., Denver—Construction has started on the freight depots of the Union Pacific system, which will be of brick, concrete and steel, 60 ft. wide and 850 ft. long. The office portion of the structure will be two stories high and the rest one story. The entire building is to be completed by Jan. 1 and will cost approximately $300,000. P. J. Sullivan is general contractor.

Wash., Seattle—The Seattle Box Company will immediately erect a 3-story factory building and dry kiln. The structure will be 65 x 100 ft. in size, of heavy timber construction, and will form the third large addition to the company's plant.

Wash., Seattle—The Associated Oil Company has awarded to the Stewart Construction Company a contract for the building of the concrete retaining wall and the pipe conduits planned by the oil company, the work to cost $40,000. The wall will contain 2,500 cu. yd. of concrete and will be 33 ft. high.